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THE FOUNDATIONS OF SOCIAL PSYCHOLOGY[1]

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Social psychology has been long in search of a foundation. In this respect, the orphan subject is like the hero of Marryat's novel: 'Japhet in Search of a Father.' The chief and important difference between Japhet and social psychology is in the fact that Japhet, whether he were or were not able to identify his paternal reason for existence, knew that his existence was actual, whereas social psychology, unless it should discover a foundation on which it might rest, has been in danger of being declared an illusion.

Several years ago, when I first began to give a course in social psychology, I felt constrained to warn my class that I didn't know what social psychology was, and didn't even know certainly if there were such a subject. But I thought there were certain matters of psychological interest which could conveniently be discussed under that title, and I proposed to discuss them. In more recent years, I have felt justified in telling my classes that I believe there is such a thing as social psychology, but that I can't define or describe it more accurately than to say that it is the attempt to analyze certain social problems from the point of view of the psychologist. And I am well aware that, although this definition fits my course, it doesn't fit a number of books which have the words 'Social Psychology' stamped on the covers.

If we take as 'social psychology' everything which calls itself by that name, I have to admit my colossal ignorance

[1] Address of the president, before the American Psychological Association, Cambridge Meeting, December, 1922.

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of the subject; an ignorance which has been increasing of late years, but which has not seriously disturbed my tranquillity, since I am confident that I have a great deal of company in my ignorance, even among the members of this Association. When I read the books of a certain group of sociologists who use freely the name of psychology, most of what I read passes through my mind like wind through the trees. And the reason for this seems to me to be because this literature is in part speculation, with neither foundation nor means of checking, in part a collection of platitudes stated in imposing words, and in part the mere grouping of phenomena under new names; none of which excite my interest to any great degree, because this doesn't seem to get us anywhere.

The reason why, on the other hand, I have been interested in McDougall's 'Social Psychology' to the point of rudely attacking it, is that I can see what McDougall is talking about, and I can see that it is really important, although I am not always sure just what he is saying about it, and don't agree with all that I do clearly understand he is saying. There is, for me, exhilarating sport in a fight with a definite and doughty antagonist, such as McDougall, but none in a combat such as Don Quixote staged with the 'thirty or more monstrous giants.'

As a matter of fact, we have had all sorts of social psychology written by all sorts of people: historians, sociologists, physicists, mathematicians, and men who are almost nothing intellectually. And most of it, it seems to me, is no more psychology than Christian Science is science. Until McDougall came along, we had very little social psychology written by psychologists. And whatever else I may say about McDougall's 'Social Psychology,' I will admit it is psychology.

But I suppose we can reasonably admit that all those who have written social psychology were longing to write psychology and would have written psychology if they had known any. And, certainly, in the broad sense, social psychology had its beginnings long before the name was applied. I don't know when the name was invented, nor by whom

first used, but it was not used in a technical sense either by Tarde or by Sighele, who are, nevertheless, to be counted among its founders.

The three great theories of historical importance by which attempts were made to supply a foundation for what is now called social psychology, were the metabiological theory of Spencer and Schaeffle, the repetition theory of Tarde, the crowd mind theory of Sighele. Many other foundations have been proposed; but these are the three of greatest importance, because of their persistent effects in recent times.

The metabiological theory, formulated by Schaeffle[1] in 1874, and independently in much more definite detail by Spencer[2] in 1877, has been almost unanimously repudiated by psychologists. The theory carries with it the implication, at least, of a super-consciousness, in which the individual does not participate; and such an implication arouses the antagonism of the individual who bases his system of values on individuality or personality. Furthermore, to those who cherish the western desire for individual immortality, the doctrine of a super-consciousness is distinctly a menace, threatening the doctrine of an indestructible, individual soul. Aside from these objections, which are manifestly due to prejudices, and not to scientific considerations; but which have, nevertheless, been very weighty; there was a more scientific difficulty to the acceptance of the theory of a super-consciousness, due to the acceptance of the phrenologists' theory of the dependence of consciousness on the function of brain cells in a simple manner.

On the old psycho-physiological doctrine, the hypothesis of a group-consciousness is objectionable, both because the analog of the cerebral cortex is not to be discovered even in highly organized social groups, and because, further, even if the hypothesis were tentatively accepted, there would be no definite criterion of group-consciousness, and hence the theory would be always a merely speculative one.

In spite, therefore, of the remarkable analogies between

[1] 'Bau und Leben des Socialen Körpers.'
[2] 'Principles of Sociology,' Vol. I., Pt. II.

the association and specialization of cells in the vertebrate animal body and the association and specialization of individuals in highly organized social groups, the metabiological theory has either been totally rejected, or else accepted as by Münsterberg as an interesting and perhaps useful device, comparable to the fourth dimension as held by mathematicians; a concept which is not to be confused with reality.

Concerning the first and second objections to the metabiological theory, there is nothing to be said, since science systematically proposes to pay no heed to such considerations. Whatever jar a hypothesis may give to our prejudices and sentiments, its acceptance or rejection is not supposed to be affected thereby.

The last two objections to the theory, while scientifically pertinent twenty years ago, no longer seem so to me. Our criterion of consciousness is not now tied up with brain localization, but is based on integrative activity. While it is perhaps true that some American psychologists still think of the mind in terms of brain areas, and even localize visual consciousness in the occipital lobe, and describe a single center for the comprehension of speech; the apparent evidence for the phrenological conception has been so thoroughly shot to pieces, that the procession is moving rapidly away from that position, and today the views of Dr. Franz, instead of being radical, are distinctly conservative.

As a matter of fact, the difficulty in finding a criterion for the existence of consciousness in a social group is of the same order as the difficulty in finding a criterion for the existence of consciousness in a lower animal, or even in another adult human being, and the form of the criterion outlined in one of these cases must apply to the others. We base our inferences on integrated activity of the organism, and we have not as yet a detailed criterion which the individual may apply to his own activities. You would all, for example, hesitate to say that the knee-jerk is a strictly unconscious phenomenon; and the grounds for the affirmation or denial of the existence of consciousness in the white rat or the oyster,

while they can be formulated in outline, are not detailed enough to be practically applicable. Even in the case of your fellow psychologist, although you may assume he has consciousness (while doubting his intelligence at times), the grounds for your assumption are no more definite than they are in the case of the lower animal or the social group. The metabiological theory is, therefore, far from being a dead issue at present, and while I have no vital interest in the theory, I think it is a serious error to assume that it may easily be ignored. In fact, certain prevalent present-day assumptions, which I shall mention in a moment, very distinctly raise the old issue.

The theory of Tarde, with its reduction of all social phenomenon to invention, opposition, and repetition, was enormously stimulating. In America, it was developed in two somewhat different directions by J. Mark Baldwin and by E. A. Ross, and the sale of their books alone has been an index of the importance of the movement. But the interest of psychologists in this type of social psychology has waned, apparently because the mere classification of social phenomena under general names, while useful for certain purposes, can not in itself replace analysis and explanation of the phenomena, but may even inhibit such analysis and explanation, since many persons are so dazzled by abstract terms that classification seems to be explanation. We have a striking illustration of this fact in the recent uses of the term 'conditioned reflex' and the term 'intelligence.' I think I am safe in saying that the imitation theory, however much it may have advanced the cause of social psychology in the past, is no longer to be reckoned with.

This is not the case with the group mind theory, derived apparently from the work of Sighele through Le Bon. Attempts at the analysis of social activities, either in the explicit terms of crowd mind, mob mind, and group mind, or in less explicit terms of group activities, are plentiful.

All references to, and uses of, the 'group mind' or the 'crowd mind' are open, it seems to me, to a vital question. Do you mean, by the group mind, anything more than the

individual minds of the individuals in the group treated abstractly? If not, then social psychology reduces to a minor, although important, subdivision of general psychology. We admit that the individual is stimulated by other human individuals, and that his reactions to these other individuals are important. We can, then, in theory at least, construct three other and coördinate branches of psychology, which we might call 'zoölogical psychology', 'botanical psychology,' and 'mineralogical psychology,' in which would be studied the reactions of human beings to lower animals, to plants, and to inorganic objects respectively.

Social psychology, in other words, would not be differentiated from general psychology in the specific materials (that is, types of processes) studied, as child psychology and abnormal psychology are differentiated from general psychology. Social psychology would study the same type of reactions of the same types of individuals as are studied by general psychology. It would be differentiated only by the *situations* in which the individual is studied, that is, by the type of environment to which he is reacting. If I may be allowed to coin a term, because none exists; social psychology would be a *particular* psychology, like the psychology of religion, and not a *special* psychology, like abnormal psychology and child psychology.

But I doubt if any considerable number of social psychologists are willing to delimit the subject in such a way. On the contrary, there seems to be an assumption, or positive assertion, that the group is more than the sum of the individuals, and the group mind more than the minds of the individuals in the group. As an illustration of this point of view, I think I may fairly instance McDougall's book on 'The Group Mind.'

Now, those who hold this view of the group mind seem to me to be attempting to find a supporting plane on a razor's edge. I can well understand the position of one who should claim that the group is nothing more than the sum of the individuals, and the group mind nothing more than an abstract term which we use for convenience in referring to

phenomena which occur in this, that, and the other mind in the group: and I can understand the position of Herbert Spencer, who would assert that through the organization of the group, there does come into existence something over and above the sum of individual members and individual actions. But there seems to me to be no middle ground between these positions. Hence, I am greatly puzzled by certain types of use of the term 'group mind' on the part of writers who seem to claim the benefits of the organic theory and the benefits of the abstraction theory, while officially denying both. At present, we can hardly regard a social psychology stated in terms of 'group mind' or 'crowd mind' as more than a vague formulation of problems still to be analyzed.

I am not sure but that there is now in the making a theory of social psychology which will attempt to found the subject on mental measurements, or, rather, I should say, on the statistical treatment of mental measurements. The coefficient of correlation has glittered before the dazzled vision of psychologists as a magic key which would unlock many doors, and the indications are that in the natural march of events, it would be viewed as the key to the enclosure of social psychology. There is, however, a strong probability that before such a type of social psychology has time to become coherent, the present naïve attitude towards the results of the correlation method will have passed away, and Pearson's coefficient will be regarded not as an ultimate result but as a detail in problems requiring much further detailed analysis. If the present attitude, which assumes a significance of the coefficient of correlation without analysis of the details of correspondence in the arrays correlated, were to continue, the foundation of a social psychology on this basis would be inevitable.

But I may postpone consideration of future possibilities and attend to the present. And the present condition of social psychology is indeed interesting. With the publication of McDougall's 'Social Psychology' arose a new school, which, free from the plague of abstract interpretation on the one hand, and from the pitfalls of metabiology on the other, has

had a significant and extended vogue, and which is today the dominant school, in spite of recent questionings. Although the psychologists may be today abandoning the instinct-psychology, the sociologists are enthusiastically taking it up. As an illustration of the high approval given the instinct-psychology a few years ago, by those officially recognized as psychologists, I may quote from Dewey's address before this Association in 1916.

"I hope I may find general agreement," says Dewey, "in pointing to the work of McDougall and Thorndike as indicative of the next great force in social psychology."[1] And in the same paragraph he continues: "Henceforth our Social Psychology is placed upon the sure ground of observation of instinctive behavior."[2] A few pages farther on Dewey remarks that "The advent of a type of psychology which builds frankly on the original activities of man and asks how these are altered, requalified, and reorganized in consequence of their exercise in specifically different environments, brings with itself the experimental attitude."[3]

The instinct theory of social psychology seems to me to proceed on the general assumption that the explanation of social relations and social interactions is to be found, not in the total psychological life of the individual, but in a limited aspect of that life, namely, the instincts.

Now, we must admit that the conception of instincts held by McDougall is not the traditional one, nor the one most current. But, McDougall's principles seem to have been largely interpreted by others, including Dewey, in terms of the current signification of 'instincts,' a signification definable in terms of complexes of activities; and it was really against this interpretation that I launched a feeble bolt three years ago in my paper before this Association, in which I questioned the existence of instincts, except as arbitrary classification-groups. I must admit that the results of my attack were at first extremely dis-

[1] 'The Need for Social Psychology,' PSYCHOLOGICAL REVIEW, 1917, **24**, 267.
[2] *Loc. cit.*, p. 268.
[3] *Loc. cit.*, p. 274.

couraging. But we have travelled far in three years, and I think that Dewey's more recent statements in 'Human Nature and Conduct,' in which he seems to adopt completely the view I expressed in 1919, that instincts are only classifications for a purpose,[1] not only indicate an about-face in Dewey's own views, but also represent a new 'general agreement,' or at least a position on which agreement is rapidly becoming general.

I have, therefore, no further interest on this point, which we can reasonably believe is practically conceded. Although finding legitimate use for the abstract terms 'instinct' and 'instinctive,' we can now turn the 'instincts' in the traditional sense over to the sociologists, who, it appears from the current sociological literature, will gladly accept them, along with the other *deus ex machina* 'intelligence,' which I am optimistic enough to believe the psychologists will also exorcise shortly: and we will have a new and thriving sociology worshipping the trinity of instincts, intelligence, and climate.

But, for McDougall, an instinct is not to be defined as a systematic group of activities, although, I still insist, in his 'Social Psychology' he discusses the instincts at various times as if they were to be so defined, and in spite of his own definition. As defined by McDougall, 'an instinct,' as expressed at least, is a threefold thing, involving an 'afferent,' an 'efferent,' and a 'central' part. These terms are, perhaps, unfortunately applied, since they do not seem to refer to the afferent, efferent, and central neural activities. As otherwise described by McDougall, the 'afferent' part of the 'instinct' is perception, or what used to be called 'simple apprehension'; and the 'efferent' part is appetition, although I should call it motor activity. The 'central' part, which is, for McDougall, the essential part, and, I think I may say, the *real* instinct, is something whose nature is not at all clear to me. According to McDougall, the 'afferent' part may be modified by the substitution of quite different stimulations and perceptions; the 'efferent' part may be modified by the substitution of quite different activities;

[1] Dewey, 'Human Nature and Conduct' (1922), p. 132.

and yet, if the 'central' part is perchance not modified, the instinct is essentially unchanged.

If I may give a somewhat exaggerated illustration, the non-essentiality of the afferent and efferent parts of the instinct may be shown. A cat, when confronted by an aggressive dog, 'instinctively' arches its back and fluffs up its tail. The cat in this case is exhibiting 'an instinct.' Suppose we train the cat, now, through a careful course of substitution, to react in this way to a different stimulus pattern, namely, a mouse. The cat now arches it back and fluffs up its tail at the sight of a mouse. Next, by another course of habit formation, we train the cat to lie down and roll over, instead of arching its back and fluffing up its tail. The cat, then, on lying down and rolling over at the sight of a mouse, is exhibiting the same instinct as formerly in fluffing up its tail and arching its back at the sight of a dog, provided the 'central' part of the instinctive performance remains the same.

If we ask, now, What is this highly important central part; we find two answers suggested. First, we seem to be told that it is an emotion. Second, that it is a neural predisposition, which is accompanied by an emotion. But, since it is obvious that in altering the connections of afferent and efferent, the neural predisposition has been altered, the first suggestion seems to be the more reasonable; and I now understand that McDougall really means that the emotion is the 'central' portion of the instinct: in other words, it is the true instinct.

If this statement does represent McDougall's actual view, then it seems that an enormous amount of confusion might have been obviated if the term 'emotion' had been used instead of 'instinct,' and the question whether an adequate basis of social psychology is to be found in the emotions might be discussed on its own merits. If my statement is not accurate, then I am thrown back into a state of uncertainty as to what is meant by the term 'an instinct.'

I do not care to enter here upon an extended discussion of the emotions. I do wish to say, however, that I do not

for a moment believe that there are a number of typical emotions of the order of those listed by McDougall, sufficiently distinct and separate from each other to be treated as independent units. The emotions seem, on the contrary, to be a vast and poly-dimensional continuum, within which, for convenience, we mark off certain ranges and apply names to them. I do not believe that there is a single unique type of 'fear,' or that there are two, four, six, or more discrete types of fear. Nor do I believe that there is a sharp line of demarcation between fear and anger, nor between fear and rage, nor between fear and disgust. If I apply the term 'fear' to the reactions of a ten months old babe, when these reactions are somewhat like those I show at times, I apply the term with the distinct understanding that the babe's fear is, perhaps, as different from various fears of mine as my fears are from my sorrow, or as the babe's speech is different from mine.

But it does not seem to me, at present, that either in instinct, or in emotion, in the general sense of the term emotion, we have the most vital factor in social interactions. Admitting the great importance of instinct and emotion, yet these aspects of mental life seem no more important than other aspects, among which are habit, perception, and ideation. In fact, it may be possible that there is no one aspect of individual mental life which is of predominant importance in social relations, and that, therefore, social psychology is really only what I have called a particular psychology. This conclusion is really an attractive one, and I am by no means willing to deny its potential importance. But before adopting it, I should like to see one more attempt made to found social psychology on specific processes, because there is one aspect of mental life, an aspect woefully neglected during the last sixty years, which seems to me of enormous importance in social life, and which may possibly be of primary importance. This aspect is *desire*.

With the erection of psychology into a separate discipline, and its divorce from philosophy, desires have been largely ignored by certain schools of psychology. For the definite

recognition of desire as an important fact of life, one must turn to the philosophers, or to the Catholic psychologists, or to certain old-fashioned psychologists, among whom I should have to be included. In examining five widely used American textbooks of psychology, I find that one author[1] ignores desire completely; one[2] merely touches on the topic very briefly and vaguely, in an inserted section of fine print, in which desire is identified with suggestion; one[3] introduces the words 'craving,' 'desire,' and 'wish' abruptly in the latter part of his book, with no explanation of what they represent; and two authors[4] devote about a page each to a serious discussion of the topic.

It will probably be understood by this audience that in what I have to say here about 'desire' I am not discussing the psycho-analysts' *wish* or *libido*, but that I am dealing with a topic which has been discussed by psychologists for centuries, and which is treated by such texts as those of Stout and Maher, who derived their conceptions of desire from the older psychologists before the advent of Freud. I may add that I outlined my own conception of desire in a book which I published before I had ever heard of Freud or his doctrines. This explanation, unnecessary here, would be necessary if my remarks should come before a wider audience, because there are many persons, and even some popular writers on psycho-analysis, who assume that the Freudians discovered all the psychological principles they have woven into their scheme. It is, however, very probable that an important basis for the popular appeal of psycho-analysis has been its recognition, in however distorted a fashion, of desire, together with the ignoring of this topic by the orthodox schools of psychology which have been in the ascendency.

It must not be supposed that in desire I am offering a mere formal substitute for the instincts. The instincts are not concrete facts, but are points of view from which we classify the mass of activities; and these same activities we also clas-

[1] Pillsbury, 'Essentials of Psychology.'
[2] Titchener, 'Textbook of Psychology.'
[3] Woodworth, 'Psychology.'
[4] Angell, 'Psychology.' Warren, 'Human Psychology.'

sify from the converse point of view of habit. Desires, on the other hand, are not principles of classification, but are actual facts in the organism of the same order as the muscular and glandular activities which are classified now as instincts, now as habits. And they are as directly observable, by the animal which has them, as are his movements of arms and legs.

We may classify desires among the *feelings* or *affections*, and we may consider feelings as being states, conditions, or changes in the *self*. This point of view has been very widely held from the scholastic period down to the present day, however much various theorizers may have differed in their descriptions of the self. Now, under the influence of the modern theory of the feelings as somatic and visceral states and processes, this point of view is still held, because the fundamental self is, for modern psychology, the body as it is experienced.

In what follows I shall assume that feelings are literally conditions and processes in the soma and viscera; including the skeletal and visceral muscles, connective tissues, and epithelia. I shall proceed on the assumption that it is theoretically possible to identify each distinguishable feeling with a definite condition or process in some tissue or tissues; and that desires, as one subclass of feelings, have their spatial locus and their potential chemical and physical formulæ. I shall assume here, also, as everywhere in the domain of psychology, that the discovery of the physiological conditions depends on and waits upon the discovery and analysis of the psychological facts, and hence shall proceed to deal with the desires as they actually occur, without waiting for the more remote physiological interpretation.

I must repeat, that the desires and the other feelings are objective facts of immediate experience, just as real and just as objective as are the colors, sounds, and other facts in the environment. They are just as capable of interpretation in the mathematical symbols of physics and chemistry as are the 'external' sense data. Sense data are perceived by reactions initiated through the receptors of the so-called 'special senses'; feelings are experienced by reactions initi-

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ated principally in receptors of the afferent visceral branch of the nervous system; but this difference is no greater than the difference between the mechanisms for vision and olfaction.

While we are considering the feelings as experienceable objects, we must not ignore their dynamic effects. A feeling is always a real stimulus pattern which is the beginning of a reaction pattern, and the reactions thus initiated are among the most important determining influences in the total reaction system. The afferent current[1] derived from feelings must go efferently somewhere, to some muscles and glands; and because of the strength of the supply, must have important results. If perceptual reactions and thought reactions concurrent with the feeling reactions 'drain' off this efferent current into their channels without seriously altering the course of these channels, the reactions may be extended and intensified, sometimes usefully. In this case, the feelings are said to be 'under control.' The affective discharge may, however, modify the normal discharge pattern of the perceptual and ideational reactions and seriously interfere with their efficacy in making proper adjustments to the environment, or even blocking the channels altogether, turning the efferent discharge into the channels for the evoking of new emotional responses. In this case, the feelings are said to be 'uncontrolled.'

In any case, the feelings are not only the background, against which external objects are experienced; they contribute also a driving force, which makes the reactions initiated from 'external' stimulus patterns more efficacious, or less so, as the case may be; but in either case, energizing and activating the whole reaction system. This activation is not the function of desire alone, but is also the work of many other feelings and emotions. Hunger, fear, rage, pain, joy, and localized sex feeling are illustrations of feelings which have 'driving force.' But none of these have social value except in so far as they involve, also, or are derived from,

[1] It is to be understood, of course, that the term 'current' is here used in the customary metaphorical sense. To say that the afferent neural activities derived from feelings must bring about the activities of efferent neurons is more exact but less clear.

desire; and even in so far as individual life is concerned, it is doubtful if man would be able to adjust himself effectively to the environment without desire.

To construct a list of desires in the present stage of investigation is a rash act. Yet, it is important that we should have a tentative list, and I have not hesitated at rashness. The tentative list includes nine desires: alimentary desire, excretory desire, desire of rest, desire of activity, desire of shelter, amatory desire, parental desire, desire of preëminence, and desire of conformity. At least four of these desires (amatory, parental, preëminence, conformity) seem to be of supreme social importance, because of the actions, emotions, ideas, and discriminations they determine and regulate. While we might guess at the tissues in which certain of these desires occur, I do not consider their physiological assignment the matter of primary importance at present.

I am using the term, desire, perhaps, somewhat rashly. I do not mean, for example, by the 'desire of conformity,' either the varied acts of conformity to the group or to the leader, nor do I mean the ideas and perceptions of difference and agreement in thought and action. I mean the feeling which lies at the root of the development of these ideas and activities, and which I believe runs through our complex emotions of embarrassment over being peculiar, of fear of seeming odd, or conspicuous in certain ways, or pleasure in being in fashion. I believe there is such a feeling, which I name from the situations in which its effects are characteristically obvious, but which I believe can exist in isolation from the acts and ideas to which it usually leads. Perhaps I should not call it the desire, but rather the radical of the desire; but the shorter designation seems at present permissible. The existence of such a simple feeling may seem less plausible in the cases of preëminence and conformity than in the cases of the other desires; but I am at least assuming it in these cases.

If we consider social interrelations, we notice three outstanding forms, represented by the family, the state, and the church; as well as various minor forms of interrelation

which are sometimes included in these, but which sometimes are in conflict with them. The problem of the family involves not only the producing and rearing of children, but also a much more complicated set of problems involving the psychological differences of sex, and the organization of two or more individuals with these differences into a group. In accordance with the exact forms the family takes, various of the first seven desires are involved in the organization. But always, and essentially, the amatory and parental. The adjustments and activities requisite to afford satisfaction of these desires, and the consequence of incomplete or inadequate or unbalanced expression of these desires, constitute the fundamental network of family problems.

The problems of courtship and marriage and divorce, and the problems of prostitution and promiscuity, can not be settled without thorough analysis of the play of these desires. It is only on the basis of an understanding of the essential difference in the conditions and forms of amatory desire between men and women that many unsuccessful families are harmonized and made successful.

In so far as the family organization suffices for the satisfaction of all of the types of desire, no further organization is necessary. And this is the situation in small primitive groups. But with increasing population, satisfaction of the first seven desires increasingly demands another type of organization, the State, which, as it arises, is necessarily in conflict with the family.

In the State, whether it be the tribe, the clan, the nation, or the less determinate group, the desires for preëminence and for conformity are given their maximal satisfaction. The satisfaction of desires of alimentation, rest, activity are regulated by the State, and for the maintenance of its own organization, it interferes in the family group, sometimes for better, sometimes for worse.

With the increasing complexity of the state organization it becomes inadequate. It becomes impossible for a single organization to provide for all desires, and the failure to satisfy adequately the desire for conformity and for activity

leads to new organizations within, and also independent of the State. The Church and secret societies are at first mere aspects of the State. But eventually these emerge as independent or quasi-independent organizations for the satisfaction of the desires of conformity, of preëminence, and of activity. These organizations not only provide opportunities for leadership and for conformity, in addition to those provided by the State, but they also provide activity, which may be indulged in for its own sake; in other words, *play*. For the desire for activity does not grow less with increasing age of civilization, or increasing individual age; and play, in the form of religious ceremonials, or ritual 'work' of secret societies, or sports, or of many other sorts, must be provided.

These venerable institutions furnish but a fraction of the problems of social psychology in our complex civilization. The recognition of desires as psychological facts and forces opens up fields of investigation which I believe can not otherwise be cultivated adequately. Problems of criminality, criminal tendency, and criminal types; problems of cultural and vocational education; of the development and maintenance of conventions and laws; of the raising of ethical standards; of the determination of the nature and conditions of feeble-mindedness, are typical features of the fields which lie before us. It is with difficulty that I resist the temptation to discuss in detail the analysis of desires in connection with some of the problems arising in these topics.

In my opinion, it is idle to discuss instinct, or emotion, or any other factors in social relations, without taking account of desire. Without desires, there are no social relations. One organism might act upon others and be acted upon by them, just as pebbles on the beach grind on each other. But this action, even if conscious, is not what we mean by social relations. If the pebbles on the beach were conscious, we might call their action-tendencies *instincts* in the same sense in which our action-tendencies are called instincts. But such a collection of conscious pebbles would still not be a society. Even cattle in the herd are associated through desire.

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If there is a basis for a non-particular social psychology, that basis can not be found elsewhere than in the social desires. In short, it may be true that social psychology must be the discussion of the effects of these social desires on thought, emotion, and conduct.

Let us suppose that we have a social psychology, either on the basis I have mentioned, or on some other basis. The question of the value of such a subject still remains to be determined. The sort of foundation I have been discussing so far is a foundation in theory only, and in order to have value, the subject must have a foundation in method. If it is true that a subject without a theoretical basis is chaotic, it is also true that a subject without a method is sterile. Hence, the examination of the methods of social psychology is of vital importance.

I have no interest in social psychology, except in so far as it may promise to become a science. Social philosophy, social history, social anthropology, economics, politics; these are all very well, and in my leisure moments I find them interesting. But as a psychologist, I must expect to find social psychology a science, or else I must abandon it.

The essential thing about science is its experimental method. On this we are all agreed, even though we are not agreed upon details of this method. We probably agree, also, that general psychology can employ the experimental method, and that in so far as it does so, it is a science. Thus, in our principles at least, we magnify the experimental method and experimental work, although it is a grim jest, much bandied about among psychologists, that the only way in which one can obtain standing and fame is to abandon experimental work and write textbooks.

Is social psychology a science? Or can it become such? Can it employ a truly experimental method? I am optimistic enough to think it can. Not only would any really experimental work on desire be a contribution to the structure of social psychology, but it may employ types of experimentation which are peculiar to its own field and not merely the application of the methods of general psychology.

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I do not refer here to social experiments in the ordinary sense, although such experiments are indeed bound to be more and more employed in the future. The French revolution and the Russian revolution have been, in a loose sense, experiments. But they have not been experiments in any true scientific sense, because of the lack of definite means of observation and record, and because, indeed, although prearranged in a certain way, they were largely natural developments, whose time and form could not be foreseen because of the very lack of experimental knowledge concerning such phenomena.

The rise and fall of the Shaker settlements was indeed a phenomenon which might have been made an experiment in social psychology, since it was indeed an actual experiment in family life, a putting to the proof of certain theories in regard to the control of sexual desire and the instinctive and emotional activities which these desires regulate. But, unfortunately, the Shaker experiment was not so utilized. And the Zion City enterprise is a closed experiment, so far as the psychologists are concerned.

As an illustration of one type of difficulty encountered by those proposing experimental work on social problems, I may mention an attempt I made some years ago to obtain an opportunity to study certain features of the Billy Sunday revivals, then in full swing. My actual problem, which I wished to investigate, was quite simple; in fact, it was quite ridiculously naïve, as you will see in a moment, since it involved obtaining the names and addresses of the 'trail-hitters,' in order to find out later something about their early religious training. I ran up against a brick wall, of course; the one thing I couldn't be allowed to do was to obtain the lists of trail-hitters. None had been kept in any city, and none were going to be made. In explanation of this situation, I can say nothing beyond asking a question which forced itself upon me as a result of my further observations. If, from the list of trail-hitters, we should eliminate children under twelve, repeaters, jokers, and church members in good standing, would any considerable number of trail-hitters have remained?

I might mention a long list of social experiments, in the loose sense, which might, theoretically, be made psychological experiments, and I suppose that some of these will some day be carried through. But the practical difficulties are so great that not much progress can be made in this direction. In this respect, educational psychology is more fortunately situated than is social psychology, because there is no obstacle in the way of actual educational experiments, except the obstacles common to all our sciences, namely, lack of vital hypotheses and lack of money.

Some educational experiments are actually in progress, in scientific form, and there are many others which can be carried out when funds are forthcoming. I fear, however, that the really experimental side of education is far too little emphasized at present, and even the name 'experimental education' is widely applied to a range of topics which are not actually experimental education at all.

Social psychology, on the other hand, even if it had the funds and the forces to carry out direct experiments, would run against so many prejudices and fixed interests, that its projects of greatest interest would be practically unfeasible.

The great, and hitherto little used, experimental laboratory for social psychology seems to me conveniently at hand, ready to be utilized, in the theater. We cannot bring about actual domestic crises for exact study of the amatory and parental desires. We cannot control experimentally real situations in which the desires of conformity or of preëminence are involved in ways suitable for precise observation. But we can present to large numbers of people plays in which these situations are sharply involved, and it only remains for us to devise methods of obtaining data on the composition of our audiences, and on their reactions to these situations. And I am sufficiently optimistic to feel confident that these methods can be devised and applied.

When I say we can present plays, I speak loosely. We do not need to have plays written to suit our specific problems, nor do we need to present these plays. The theatrical profession is doing all that for us. All we need to do is to

select, among the multitudes of presentations, the plays which do present situations on which we wish data. The *control* of conditions is there. All we need to do is to select the particular controls which fit our experimental needs. And if the methods of which I spoke are developed, the application of these methods may fully satisfy the scientific cause of experiment.

As an illustration of my meaning, I may cite a problem which is not as specific as we should ultimately require, but which is sufficiently clear for present purposes. How, in the scale of moral values, does incest compare with other sex offenses, in the estimation of various sections of the populace? Direct questioning of large groups of people is not only impossible, but the judgments, if they were obtainable, would be difficult to evaluate. But through a study of a selected group of comedies and tragedies, and a study of the effects of these plays on the public, including among other data those obtainable from the box office, we can obtain a mass of evidence which leaves us in no doubt whatever.

In making use of the theater, there are, of course, a number of problems concerning the theater itself which have to be solved before we can make use of theatrical data in a wider way. As an illustration of this, I may cite the opinion which is shared by many eminent producers and actors, and which I have found firmly held by a doorman who has been longer in this position than any other I have found: the opinion that the *raison d'être* of the type of respectable musical comedy in which the female members of the cast are lightly or sketchily clad, is the fact that the exposure of the female form, provided it is beautiful, makes an especial appeal to the women; and the theater, like the church, depends primarily upon the interest and influence of the women.

Here is a point on which some data have already been collected. The preliminary inspection of these data apparently shows that the theatrical people are wrong, because the percentages of attendance of the two sexes are against them. Greater exposure of the females of the cast does go with greater percentage of male attendance, as well as greater

total attendance. But upon close analysis of the audience and the show, the opinion of the theatrical people is shown to be correct. I shall not go farther into the details of the experiment, because it is not complete, but it is a matter which has bearing not only on theatrical problems, but also on other problems which superficially seem remote from it, especially on fundamental problems of sex psychology.

The important consideration in regard to this sort of experimental work is the coöperation of theatrical people. And of this I wish to speak last, because it is of the utmost importance. At present, this coöperation is full and hearty. This is true of the manager, impresario, and principal of the concert and operatic stage, and of orchestras. These persons do not always know what we are driving at, but if we think we can get something of scientific value, we can go the limit in investigation, so long as we don't actually interfere with the performance. I have found no group of people in practical life more willing to open their field to investigation than those of the theatrical profession. But I already have good and sufficient evidence that this may be changed. One wild psychologist, or one who is unintelligent and unsympathetic in this particular field, or who raises the suspicion of not being absolutely straight, may easily put the whole profession, from gatekeeper to leading lady, in a condition where the word psychologist acts upon them as the tune 'Boyne Water' does on the Sinn Fein. The field is one into which the psychologist must enter not without preparation, understanding, and due humility.

In conclusion, let me revert to the general problem with which this paper began, and towards the solution of which my discussion is intended to be a contribution. Is social psychology hopelessly illegitimate? I think it is not. I think we need not disown it, nor relegate it to the class of particular psychologies; nor need we regard it as a dummy, clothed in a motley of pieces stolen from various sciences. It is a vital and respectable subject, to which we can give an honorable place in the family of special psychologies.

INTROSPECTION AND BEHAVIOR

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In this discussion we shall attempt to show (1) that radical behaviorism,[1] as it may be called, is hopelessly inadequate in principle, to serve either as a system of human psychology or as a method of attack upon the problems of human psychology; and (2) that instead of being different in kind from so-called objective observation, introspection in principle is a similar kind of observation. In other words, introspection is no less behavioristic than other methods of psychological observation. Psychological progress, today and in the future, depends upon the combined use of the two procedures and upon such scientific undertakings as generously admit the greater value of a combined point of view.

Introspection has had its faults like other methods. It has fallen short of its purpose to reveal acceptable and far-reaching results wherever it has studied mind for mind's sake; the point of view has been too narrow; its findings have been structural and not sufficiently functional; and reactors for the most part have not been sufficiently trained. Moreover, it is evident that in certain instances experimenters have misunderstood the nature of introspection itself and have thus been led to pin their faith upon superficial and relatively meaningless data, if not upon artifacts.

Furthermore, the method has been attacked from time to time by persons who have shown no evidence that they had given the method a fair trial or that they were sufficiently trained in the method themselves to be qualified judges.

The most ardent introspectionist can agree with his critics that introspection has its decided limitations. Granted that psychologists are interested in analyzing what human

[1] The extreme position as advocated by Watson and Weiss.

beings are doing—behavior—introspection tells us only a part of what a person is doing even at the time of experimentation; it furnishes data only on the preliminary stages of a given reaction, whether that reaction be simple or complex. Even the genetic method whereby cross-sections, so to speak, of a reactor's consciousness are obtained from time to time, does not give us a complete account of a given act.

Conversely, the radical behaviorist might very well concede the point that the majority of human actions in which the psychologist is interested are under the control of functions which, for the lack of a better term, we call mental or covert behavior; that in studying these actions from their point of view one obtains data only on some of the conditions under which these actions take place, together with data on the end-stages of these reactions, namely, glandular and muscular responses.

The introspectionist can grant that his method of analysis reveals the details of behavior in its incipient stages, but fails quite as much to expose the facts of behavior at large as the anatomist's scalpel fails to disclose the facts of physiology. Introspection is the psychological-anatomist's procedure, and no amount of hypothesizing about determining tendencies or other alleged dynamic mechanisms will furnish him with an adequate functional supplement. He must resort to interpretations of a behavioristic type, such as involve the concepts of stimulus and response, the physiological mechanisms of reflex action and the like.

The introspectionist can also grant that his method at best will not yield those adequate quantitative data so essential in all well-rounded scientific investigations, by which his results can be summarized, classified, and used for the all-important scientific purpose of prediction. It is impossible, for instance, to reduce to quantitative terms the qualitative data on reasoning, the concept, the judgment, and the choice. Such introspective data are worth nothing, as they stand, in an attempt to predict what details of imagery will

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arise in a certain reactor's mind the next time an experiment is repeated, even if the conditions of experimentation be standardized.

Further, the introspectionist admits that his results have often been inadequate and even misleading. Consequently historic controversies have arisen from time to time. Sensation and its attributes is a case in point. Imageless thought is another. What wonder that little agreement has been reached among psychologists at large as to the number of attributes of sensation when, perchance, it may turn out that there are no such attributes at all! Introspection, imperfectly applied, may have given us a wrong picture of the situation entirely, even from the so-called structuralist's standpoint. Another case in point is the self. Nine-tenths of the disagreement about consciousness of the self can unquestionably be laid at the door of crude and ill-applied introspective technique.

But these mistakes need not condemn introspection as a method, for in no way do they militate against the principle involved. Rather, they warn us against repeating our errors of the past. One does not discard a promising method because it yielded poor results for a time. On the contrary he sets about to improve and if possible to perfect the method. Even the apparently damaging indictment, *Kundgabe* and not *Beschreibung*, loses its sting when we realize that after all introspection is throughout interpretation, reducible to finer and finer degrees of nicety.

We said that radical behaviorism is hopelessly inadequate, in principle, to solve systematic or methodological problems of human psychology. Drastic as this may sound, there are reasons why the issue may be stated in unmistakable language. First, from a behavioristic standpoint, the method yields only quantitative results. This muscle or that is moved just so much and at a certain speed; learning is measured in units of time, accuracy, and distance; a gland secretes this much or that under prescribed conditions; so many words are memorized in a given amount of time under a given set

of conditions; and so on. All of this information is indeed essential to psychology, but when the behaviorist wants to know the significance of these figures what does he do? He interprets; and he interprets just as does the mental tester or the statistician, namely, from his qualitative knowledge of human nature. Introspection is necessary as a method of providing this qualitative knowledge in sufficient detail to be scientifically worth while.

The radical behaviorist is not alone in this dilemma. In science generally, qualitative data must supplement the quantitative. The chemist and the physicist lend meaning to their quantitative measurements by supplying all sorts of qualitative conceptions such as those of gravity, energy, affinity, catalytic agency, positive and negative attraction, and the like.

Now the radical behaviorist might very well insist that he is providing himself with a qualitative analysis of his results when he reduces them to reflex or other physiological mechanisms. But in so doing he is avoiding qualitative interpretations that are truly behavioristic. Once one refers, for qualitative explanations, to a science which is basic to his own, he is ignoring the qualitative features of his own data as they stood previous to analysis into data of the basic science. That is, rather than working out the qualitative aspects of his own original data from the standpoint of his own science, he has been content to make the jump at once to a lower order of complexity of events; there, however, finding that he is no longer a behaviorist nor a psychologist, but a physiologist, a chemist, or a physicist. Hence he discovers basic structures, but not functions in his own science. A sociologist might just as well insist that he has given a sociological description of a theft by describing it, physically, as a series of motions, and operations of levers (muscle and bone).

The behaviorist's data undeniably possess qualitative features of their own; they possess their own unique syntheses whose descriptions can be given only in terms of their own

laws and their own technical language. These qualitative features he is entirely overlooking; and they are what we call mental processes. They are his true behavioristic functions.

For the sake of making the point clearer let us resort to a similar situation as it is found in biology. The physiologist finds that digestion consists of a certain number of chemical and physical processes. These can be studied in a test-tube. But of what significance are these processes, considered as digestive processes, unless they be described in their own peculiar setting? A complete description of digestion is not furnished by resorting to its constituent processes as described in the more basic sciences of chemistry and physics. Would it be called digestion by some hypothetical observer in a universe devoid of living organisms? In other words, an organic setting must be taken into account before these chemical and physical processes can be regarded as physiological. The organic setting corresponds to the qualitative features of the behavioristic data referred to above.

The physiologist does not forsake his stomach, his glands, and his food, no matter how minute an analysis of digestion he makes. Why then should the behaviorist forsake his mind? The behaviorist can no more give us a system of psychology when he excludes its own, unique setting of conscious activities, than the physiologist can present us with a physiology if he excludes from his field the living organism. In other words, radical behaviorism is not behaviorism at all—it is not a study of what the organism is doing as a whole—it is merely glandology, muscleology, and physiology, just as physiology would, under parallel circumstances, be test-tubeology, chemistry, physics, and nothing more. From a systematic standpoint, then, the radical behaviorist has nothing to offer us except his figures and some physiology. This is why we have charged his scheme with total inadequacy from a systematic standpoint. Let it be remembered, however, that so far as he goes in insisting upon the importance of his method and viewpoint—the study of response—we are with him heart and soul.

A second reason why radical behaviorism, by itself, is a

one-sided affair, lies in its incompleteness of method. It is too unscientific. One of the unpardonable sins against scientific procedure is that of leaving, uncontrolled, known conditions which affect or may affect one's results. The radical behaviorist admits, of course, that conscious activities take place. We assume, therefore, that he concedes the presence of conscious activities in human beings. Now most of his investigations are performed on reactors who are awake or who are not under the influence of a deep anæsthetic.

He would admit, further, then, that conscious activities are going on in the behavior of his reactor during experimentation. The behaviorist confesses to be uninterested in these activities. What more do we want, he insists, if we can confront the reactor with controlled stimuli and find such uniformities in his overt responses as will furnish us with consistent data? This is both practically and theoretically impossible. The stimuli are not all controlled 'from the outside' as long as the reactor is conscious; the reactor is responding not only to external stimuli such as a maze or a set of instructions, but to the many activities which we presume to call conscious (better, I think, covert behavior) and his reactions, as seen by the radical behaviorist, are secondary products. Numerous variations in the reactor's overt behavior take place uncontrolled by the experimental setting; and yet our radical friend would insist, in principle, upon interpreting his results without the aid of expert knowledge of the intervening and controlling events. His data, then, are bound to be misleading, erroneous, statistically rather than logically consistent, and valuable for prediction only because they happen to work and not because they can be understood. One might just as well attempt to demonstrate Boyle's Law without a knowledge of temperature conditions.

Suppose, for example, one is studying thought processes by means of an apparatus attached to the tongue and throat. The reactor is asked to think of 'E' and he furnishes an excellent record on the smoked drum. Another individual thinks 'E' and gives no record. The radical behaviorist must now conclude that the second reactor did not follow instruc-

tions or else that his apparatus failed to work. He must not ask information from the reactor, for that demands introspection. Thus the radical behaviorist would never know that the reactor really thought 'E' by having auditory imagery of it or by visualizing a printed 'E.' Moreover, in the first case the record is only the crudest circumstantial evidence that the reactor actually thought 'E.' Let the reactor prove more definitely that he thought 'E' by describing his imagery of it, its location, its behavior *et cetera*. Thus we see that quantitative results, alone, are in principle untrustworthy. Just as introspection needs 'objective' checking, behavioristic data, so-called, need introspection.

Radical behavioristic data alone, then, neither offer us a complete system of behavioristic ideas nor provide us with quantitative results whose validity can rest unquestioned. Introspective data fill both gaps. In either case they are only means to an end. They complete the psychological system by furnishing the truly behavioristic setting and they provide us means of controlling or of obtaining information on such conditions of psychological experimentation as the radical behavioristic method ignores.

Now as to the second assertion made at the outset of this paper, namely, that introspection does not differ in kind from other methods of scientific observation. First, the notion rests upon the alleged distinction between the subjective and the objective. Usually the term 'subjective' refers to the position of a mental process with respect to objects 'outside' the mind. Mental states, it is said, are subjective because they belong only to the person possessing them (an absolutely unverifiable hypothesis, by the way); they are not common property of persons at large. One person cannot observe another's thoughts; they have to be told by the person experiencing them. But that this is a valid reason for classifying mental processes as subjective in opposition to objects which by an apparent contrast are not subjective, is open to serious question. All we know about the problem is the fact that as yet science has not discovered an adequate method

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of investigation whereby ideas can be studied directly, after the fashion of studying chemical processes in a test-tube. Neither has science discovered a method for studying life, as such. Hence there is no positive evidence whatever that mental processes are 'subjective' as contrasted with the 'objective.'

Moreover, all objects are 'subjective' in exactly the same senses as mental processes are 'subjective,' as far as we have any power to judge. The tree which stands in one's front yard is subjective because it is not the same tree which is observed to stand in the back yard! Any *particular* object is subjective with respect to itself for the very reason that it is not some other object. Because one's mental processes are not some one else's, then, is no reason for calling them 'subjective.' 'Subjectivity,' in other words, is a synonym for 'organized unity.' Because the human mind is an organized unit we cannot separate ourselves from ourselves, a characteristic quite as common to any object as well as the human mind.

In multiple personality, be it noted, we have an approximation to the state of affairs found in physical observation where a datum is common property to more than one observer.

Secondly, the alleged distinction between introspection and objective observation diminishes when one carefully investigates them from a psychological point of view. Either form of observation is an act of knowing; each involves the development of meaning; each involves the process of interpretation. In each case the individual is responding to a stimulus. In the former case the stimulation is a so-called physical event; sensory and imaginal processes are involved in the resulting response which is perception—a cognitive process. Meaning—a phenomenon of behavior—is referred to the object or stimulus. In the second case the stimulus is a so-called mental event, just as external, however, to the act of knowing as is the so-called physical stimulus in the first case. Sensory and imaginal processes are involved in the resulting response to this mental event and the response is just as much a perception as in the first case, *i.e.*, it is just

as much a cognitive process. Meaning is likewise referred to the stimulus or process observed.

Hence both in introspection and in observing objects, observation is a process of responding to stimuli. In one the thing observed is quite as external to the process of observing as in the other. A stimulus-response relation obtains in both cases. Indeed, the act of knowing, wherever found, is response to a stimulus. The subjective-objective relation, then, is nothing more, in a last analysis, than a stimulus-response relation. We give to an act of knowing its distinctive name for the reason of its complexity.

The old argument that a mental process is ultimately different in nature from a physical process because the first does not possess the physical properties of weight, mass, conductivity, *et cetera* is of course obsolete. We regard mental processes not as things—substances—but as functions. Everywhere in the so-called physical realm there are phenomena which, like ideas, cannot be dealt with as substances. One cannot pound the movement of his finger any more than he can pound an idea; the surface of a table lacks specific gravity quite as much as does unpleasantness. Obviously the problem of the subjective and objective is only a logical one after all, and but a species of the more abstract problem of the static versus the dynamic or of structure versus function.

While in practice we assume that physical objects are substances, the fact remains that substance is nothing but hypothetical matter. To call a thing a substance is but a practical, although necessary means of describing it structurally. The whole affair is arbitrary however. We discover that it is the behavior of ions or atoms that gives to things their apparent 'substantiality,' and that substance is nothing but 'form.' Water, for example, is a substance only with respect to something more complex or with respect to other things. In and by itself it is not a substance but a ratio of hydrogen and oxygen in combination. Under different circumstances it assumes the three modes of existence—solid, liquid, and vapor—all reducible to hypothetical solid parti-

cles in different rates of motion. Certainly such a situation has no more claim for objectivity than for subjectivity.

Likewise with mental processes. They are not 'substances' to us because we have no point of reference beyond or above them. However, the term 'content' or 'structure' means for the psychologist quite all that the term 'substance' means to the chemist. In short, a confusion between structural and functional points of view has been responsible for the divorcing of the mental from the physical. The mind-body problem and its partner, the subject-object problem, belong to the logic of science and not to metaphysics nor to epistemology, in a last analysis. Quite properly so, for logic is basic both to metaphysics and to epistemology.

Thirdly, the criterion for the truth or validity of an observation is quite the same for introspection as for other methods of observation. That criterion is agreement among observers—consistency of response to stimuli. Agreement, to be sure, is sometimes reached more readily and observations are sometimes made with less error in the physical sciences than in psychology where introspection is involved. This is due to the accessibility of the data observed and not to inherent differences in methods of observation. Needless to say, mechanical devices for controlling one's observations and for checking them may render objective observation, so-called, more reliable than introspection; yet mechanical checking is used for the same purpose in both methods. But it must be remembered in this connection that variability of results from introspection is due to the natural complexity and variability of the subject matter rather than to inherent crudeness of observation. Variability of results is proportional to the degree of complexity of the smallest unit or element of the material observed. Physical elements are relatively simple and stable; the ingredients of physical complexes are known and can be controlled; hence observations are relatively exact. Biological observations are less exact in the long run because the biological unit, the cell, and any physiological process whatever are relatively complex phenomena and their ingredients are neither wholly known

or controlled. Psychological observations are still less exact because of greater complexity of the units of behavior—the elementary mental process and the simplest coördinated response. We are ignorant of their basic ingredients and hence cannot control them so well. Moreover our chances are not very good of knowing their basic ingredients as long as we have to kill our reagent to get at them. The exactness of an observation will not rise *above* the exactness and variability of the thing observed.

Fourthly, it is argued against introspection that one never knows whether he is observing the same process from time to time, no matter how well he has tried to control it, while in physical observation one can rest assured that his datum has not changed between inspections. How can we be sure whether or not a physical object has changed between observations when the only evidence for its permanency is agreement among observers? Actually the object may have changed and probably it has. The only thing we care about is agreement in our observations. Likewise with introspective data. It is not an indictment against the method to charge it with a shortcoming which is applicable to the method with which it is compared. A change in original mental data is quite as subject to detection as a change in physical data. In proportion to the complexity and natural variability of original data the source of error here seems no greater in the one case than in the other.

Fifthly, it is said that introspection changes the process observed. This complaint is quite as meaningless as the others. One has to destroy a chemical compound to ascertain its ingredients; he likewises destroys a task-consciousness, temporarily, while observing it. Attention functions in introspection quite as the anatomist's scalpel does in dissecting the human body. Analysis of structure in all science is made generally at the expense of the original structure if we wish to get below the surface. Observation of behavior, however, does not change the process behaving any more than watching a reaction in a test-tube changes the process there going on. Of course a bungling observer will spoil an ex-

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periment on fluctuations of attention by not following instructions carefully, just as a bungling observer at the bench will spoil a chemical experiment by overheating his reagent or by overturning the beaker. Many psychological observations have been spoiled by clumsiness and under such conditions the mental processes which one intends to study are subject to distortion, but the cause is not inherent in the method; it is found in the fashion with which the method is applied. Our chemistry would not be as exact today as it is had our chemists all been blacksmiths.

Finally, introspection is as behavioristic a procedure as is watching a rat run a maze. One has timing and other mechanical devices, to be sure, to help him observe the rat's behavior; but so one has in introspection. There are timing and other mechanical devices to check and give additional data where introspection is involved. Introspection is response to one's own mental processes. Even a structural analysis of a memory consciousness is a verbal and attitudinal motor reaction to visual or other imagery, or in its more attenuated forms it is hardly more than a verbal response to instructions and to previous verbal imagery. It is motor in character and is reducible to reflex mechanisms, no doubt, over no less circuitous an explanation than the act of noting that a horse is running down the street.

In summary, then, introspection should be used in connection with the gathering of behavioristic data for the two following reasons: (1) It provides information about the setting in which overt behavior takes place just as the physiologist provides his setting by resorting to anatomical information. Until behavior as a whole is studied, one can hardly call himself a behaviorist; and since man is consciously acting as well as making overt bodily movements, behavior as a whole is not studied until introspection is used as a supplementary method. (2) It provides the necessary checks on the reliability of data 'objectively' obtained. The radical behaviorist is unscientific in that he ignores known conditions and processes which influence and interpret the overt reactions to which he has arbitrarily confined himself.

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We have seen that it is unsafe to call a method or a system behavioristic because it is 'objective,' or 'objective' because it is behavioristic. It is behavioristic only because it deals with behavior or response and as far as it is psychology it is quite by accident that the response is motor in character. Introspection deals quite as much with response; these responses are essentially motor in character; they are just as much behavior as is coördinated motor response, if not more so, since behavior is what the organism is doing. A mental process and its outcome in overt action are inseparably connected; the distinction between the one and the other, although practical, is as arbitrary as the distinction between cause and effect or between two stages in a process of motion. What grounds, then, remain for divorcing the two methods—introspection and 'objective' observation—in psychology?

At least we might forget such old philosophical beliefs and assumptions as are decidedly shaky and separate the 'subjective' from the 'objective' in an unwarranted fashion; we might have more patience with a method which requires months if not years of training and undoubtedly a certain knack. We might inspect more carefully certain problems in the logic of science which unquestionably point out that what we have thought to be metaphysical and epistemological problems are only logical problems after all. We might search for such reasons why introspection should be avoided and condemned as are more fundamental than the misleading charges of the past. And, what is more important, we might combine in a more tangible fashion our psychological policies and aims, dispensing with an over-consciousness of 'schools' and psychological 'sects.' Then, perchance, such reminders of our psychological provincialism as 'An Open Letter to Anti-Behaviorists' will not decorate our current psychological literature; rather, much valuable space which is now overcrowded with much ado about nothing will then be devoted to the solving of live behavior problems.

AN OBJECTIVE ANALYSIS OF VOLITIONAL BEHAVIOR

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Before proceeding to an analysis of volitional reactions which will be the subject-matter of the present article, we deem it necessary to make a distinction between volitional action and voluntary behavior; because we consider that what are called volitional or voluntary behavior (these terms are traditionally used synonymously) consist of at least two entirely different types of action.

We venture to suggest that if it never appeared necessary to differentiate between volitional and voluntary action it was because both types were presumed to be movements controlled by mental states. All the activities called voluntary were considered to be varieties of motor action constituting the effects or outcome of undifferentiable mental states.

When, however, we consider the data of psychology to be complex unitary responses of organisms to the stimulus objects and conditions surrounding them, then we assume that the problem of psychological description is to attempt carefully to analyze out of our intricate behavior complex as many differing action forms as we can discern. Accordingly, we base our differentiation between volitional and voluntary action upon divergent modes of contact between the acting individuals and different stimulus objects.[1]

While we plan to divide what is traditionally called voluntary behavior into at least two named classes, to wit, volitional and voluntary, we do not at all pretend that we can reduce to only two kinds all of the adaptations that are

[1] We believe it is conserving a pernicious animistic tradition to make the at least two interacting things which science demands as the basis of its data to consist of (1) the 'mind' or consciousness, and (2) the body, instead of stimulus and person (response).

ordinarily called voluntary (or volitional). It is possible that even the subclasses of volitional behavior alone, which our analysis will reveal, ought to be considered as independent types of psychological phenomena.

By way of justifying the separation of voluntary action from volitional behavior we attempt to point out some salient differences between the two.

Voluntary action is typically the response to a definite problematic situation. Accordingly, the response pattern of voluntary action will include a choice action, a definite procedure with a decision and possibly a complete reasoning act. These choice and deliberative responses are completely absent in volitional behavior. Again, voluntary action as a type is manifestly more complex than volitional behavior, for it is probably (especially when it involves a precurrent reasoning action) the most complicated of all human behavior. Further, by stating that voluntary action involves reasoning factors we have implied that its patterns are replete with implicit actions of all sorts and with self-communicative language, and in these respects are different from the actions we call volitional, although it is not unlikely that they merge into each other at some point.[1] Also, voluntary action may involve genuine delay of behavior, the postponement of an action until a future time, while volitional reactions, as we shall presently indicate, occur in their completeness immediately upon the first presentation of the stimulus.

I. *The Nature of Volitional Action.*—In general, volitional responses constitute very complete forms of behavior occurring under shifting and flexible conditions; or when a number of conditions must be reacted to at the same time. Characteristically, therefore, volitional reactions involve a number of auxiliary responses in addition to the final action. Because we must be dealing here with a single act of psychological adaptation (behavior segment) we will call the final adjustment the definitive or consummatory response. The volitional behavior segment, then, will consist of the response side of a definitive response (batting the ball) and

[1] Our sixth subclass of volitional action comes close to being a voluntary action.

other precurrent reactions (in part responses to auxiliary stimuli, stance, arm and hand movements, head actions, eye movements, etc.). Let us be sufficiently cautious here to observe that the volitional reaction pattern, as compared with other types, contains precurrent reaction systems in addition to the ordinary attention and perception reactions characteristic of every behavior pattern.[1]

To be concise, a volitional reaction is one in which some other acts besides the definitive response must be performed in order that the definitive response itself can occur; as when one must go some place, or stoop down in the place where one is located to pick something up. Or else, the reaction involves the use of instruments or apparatus which have to be reacted to both *per se* and also as means to accomplish the larger action to the adjustment stimulus.[2] Here the volitional action is illustrated by aiming a gun or writing with a typewriter. Not only is one reacting in these cases to the person, say to whom one is writing, or to the object at which one is shooting, but also to the typewriter or the gun.

Coincident with the operation of several responses in the volitional behavior segment, we find in such situations more than one stimulus. We discover here no exception to the fundamental psychological principle that each response system must have its own particular stimulus. Accordingly, volitional behavior segments comprise a series of auxiliary stimuli besides the adjustment stimulus. The latter correlates with the definitive response, while the auxiliary stimuli are connected with the auxiliary responses. In our aforementioned illustrations the gun or typewriter are auxiliary stimuli, that is auxiliary to the adjustment stimulus, the

[1] A habit response, for example, involves (1) an attention act, (2) a perceptual reaction system, and (3) a simple or complex final action, but the volitional response involves in addition meaning and auxiliary reactions. *Cf.* sec. X. below.

[2] By adjustment stimulus we mean the object or event to which, or person to whom the actual adaptation is made. In this sense the adjustment stimulus contrasts with the auxiliary stimuli, which, while influencing the final response, are not themselves the objects or conditions to which the response is made. In chasing a dog, the chasing action is a response to the dog as adjustment stimulus. Now this chasing reaction may be conditioned by the presence of a stick or a stone in which case these objects become auxiliary stimuli.

target aimed at or the person written to. As we shall presently have ample occasion to observe, the preceding precurrent reactions may serve as stimuli to the succeeding responses.

Volitional reactions may also be considered as detached or somewhat removed from the stimuli. Because much preliminary or precurrent behavior must take place before the final responses operate, such consummatory reactions have the appearance of being detached from their correlated stimuli. Moreover, there may be great variance between the definitive and the auxiliary reactions; so that the same sort of auxiliary acts may be connected with entirely different definitive responses; consequently this fact adds to the remoteness of the consummatory responses from the adjustment stimulus. Such remoteness does not imply a genuine temporal discontinuity of stimulus and response, since, far as the final response may be removed from the adjustment stimulus in time, the intervening activities are directly in line with the final activity. For this reason we might say volitional reactions are durational activities and not delayed. It must not be overlooked that besides some phase of the response starting immediately upon the appearance of the stimulus the other phases follow directly until the conclusion of the particular behavior segment under discussion.

Possibly by far the most intrinsic characteristic of volitional behavior is that the definitive response when it finally occurs is definitely conditioned and directly determined by the preceding auxiliary reactions as well as the objects and conditions constituting the stimuli to those reactions. All this of course in addition to the determining of the consummatory response by the adjustment stimulus or its setting. Consider that the foremost differentia of volitional responses is that because the stimulus situation shifts or is flexible the final response is indeterminate until it is conditioned by the auxiliary stimuli objects and conditions.

The precise mode in which the precurrent responses condition the final or definitive response differs in the numerous types of volitional behavior which we daily and hourly

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perform. In some cases, and these the most simple, the definitive action is preceded by some single overt act, placing the person in closer contact perhaps with the adjustment stimulus, as in the case of approaching a picture to look at it more conveniently. In such an instance the precurrent movement or action may be considered in function very closely analogous to the attention reaction which precedes the perceptual behavior system in an antecedent phase of the total behavior segment, although in volitional behavior the precurrent action is ordinarily connected with a performance and not a knowledge act, namely, the consummatory action.[1] These volitional precurrent actions may be responses to the original adjustment objects, since the same natural objects may encompass a variety of stimuli, or they may be responses to auxiliary stimuli independent of the adjustment stimuli. In the former cases they must be closely integrated with the other precurrent actions and the final reaction in the behavior segment.

In contrast with this simplest case, volitional reactions may be conditioned by series of precurrent responses that have been in previous circumstances connected with both the stimulus conditions and the definitive action which reappear in the present behavior segment. Such a situation as this we may look upon as a middle stage in the hierarchy of volitional reactions: middle stage, we say, because the determining or conditioning character of the precurrent response is owing to an actual previous contact of the person with the same general stimulating conditions, while the most complex reactions in the volitional series are those in which the person performs actions precurrent to the definitive response and constituting full and direct anticipation of that final response. Exemplifying such behavior are the activities of a mechanic, say, in inspecting or assembling a complex standard machine. It is such actions as these that deserve the name, if any do, of purposive behavior.

Our most intricate volitional action situation is illustrated by the moves in playing chess. The play of the opponent

[1] This does not mean to say that the consummatory response cannot be an informational reaction.

is the stimulus to perform a definitive act (move), but this act is also conditioned by the status of the board at the time. This illustration we use because there can be no question concerning the anticipation of the player's act, since, as a matter of fact, he also anticipates the move of the opponent.[1] Now this knowledge reaction preceding the final act operates in no other way than to anticipate the final response; there is no deliberation and no problem solving. When such processes do occur, however, the behavior segment is much more complex and deserving of a different name; in fact, such more complex reactions we call voluntary actions.

Still another way to characterize volitional reaction segments is to point out that they invariably involve meaning responses[2] of a greater or lesser complexity. In fact many of the precurrent responses above referred to are such meaning reactions. Sometimes these meaning responses are simple overt reactions, while in other cases they consist of definite complex implicit behavior of various sorts. Moreover, in the more complex volitional responses many meaning reactions may operate, whereas in the simpler types one or only a few may function. Of such meaning responses and their operation are constituted whatever is meant by foresight of the final phase or the complete volitional reaction pattern.

II. *The Volitional Behavior Segment.*—Upon examination a volitional behavior segment reveals immediately a number of striking marks which differentiate it and make it stand out as a unique type of behavior.

In the first place, a volitional reaction system is so complex that in the more complicated sorts it involves as much action and adjustment as would ordinarily be comprised in several and even many behavior segments. In a genuine sense, then, volitional behavior segments are compound and may

[1] We assume in this illustration that the conditions are not so definite that an actual choice has to be made, for in that case we should prefer to call this a full-fledged voluntary action.

[2] The term meaning response signifies a reaction which serves to determine the character of a later action. *Cf.* an article by the writer, entitled 'An Objective Interpretation of Meanings,' *Amer. J. of Psychol.*, 1921, 32, 231–248.

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be said to consist of a number of component segments. In view of the final adaptational connection between a stimulating situation and a response, however, we cannot say, of course, that there is more that one behavior segment in the whole situation.

In the second place, volitional behavior segments are phenomena of occasion. The total activity, though not the detailed adjustments, is improvised through the influence of the specific environing conditions (adjustment and auxiliary stimuli) at the time. We might look upon each behavior pattern as a unique combination of response factors, all of which, operating in conjunction with their connected stimuli, amount to an original form of psychological adjustment. In this respect volitional responses are most sharply marked off from habit responses, although the latter frequently attain an amazing complexity.

Only the total combinations, however, are unique, for the objects reacted to in volitional behavior are after all familiar to the person. It is only the particular arrangement of them which makes the total reaction original. This situation is dissimilar from the one we find in imagination and reasoning action segments, for in these activities the stimulus objects are not merely adjusted to but are recreated in a distinctly new manner. Likewise the final acts in these cases are unique and may be said to be developed in the particular situation in which they operate.

Both the flexibility and complexity of volitional behavior segments are owing to the fact that because the stimulus conditions are uniquely organized, the final or definitive response must be determined and conditioned by the whole series of environing circumstances (stimuli) and not merely by the adjustment stimulus. In consequence, the person performs many and diverse activities between the time he is first stimulated by the adjustment stimulus and the time he performs the final or consummatory response. The necessity to meet all the conditions impressed upon the acting person by the various auxiliary stimuli, complicates and makes each volitional reaction unique.

III. *The Operation of Volitional Action.*—Just as in every complex case of psychological behavior, volitional reactions comprise the operation of a definitive final response (securing paper for instance) to some adjustment stimulus (say, the need to get the paper). But we have seen that the definitive action is not only conditioned by the adjustment stimulus but by other stimuli and actions, and as a consequence numerous specific modes of operation are possible, depending upon the precise conditions of the situation. Just how our illustrative act will work out will depend upon whether the paper can be secured by merely extending the hand, or whether the person has to go to another part of the room or to an entirely different room to get it. It depends also upon whether the person knows precisely where the paper is, or is only acquainted with that fact in an indefinite way. In general, we may say that volitional reactions differ from each other in the matter of how closely the anterior meaning responses (directing oneself or moving toward the paper or the place where it is located, or naming the place) are connected with the definitive response (specific movement of securing the paper) and with the necessary interpolated reactions (getting ladder, opening cabinet, etc.), besides of course varying in the specific identity of the stimuli and responses involved.

In the sort of illustration we have used, and even more in increasingly complex situations, must the descriptions of how volitional actions operate take account of how the adjustment stimulus (need for paper in our illustration) initiates a meaning reaction (movement or set toward the paper or knowledge of its location, conditioning all later action), which is also partially conditioned by auxiliary stimuli (location of paper). Also, such a description must take account of how the auxiliary stimuli (floor, chair, door, ladder, cabinet, etc.) initiate and condition intermediate reactions (going into other room, opening cabinet), which in turn condition the consummatory reaction (getting paper) in common with their own (auxiliary) stimuli. And finally, how the consummatory response (initiated by the adjustment

stimulus) through the meaning reaction, which in a sense represents it while at the same time conditioning it, determines to a certain extent what the intermediate actions should be like and also which of the surrounding objects should be auxiliary stimuli.

But let us observe that here we are considering a case in which the final or consummatory response of the behavior segment is itself a fairly simple action. We can well imagine how much more complicated the situation is when this definitive act is itself a complicated behavior such as the solving of a technical problem or the drawing of a plan.

Yet in spite of the great variety and complexity of volitional behavior we may still isolate as a general characteristic of such behavior at least three stages or types of operation, each of which we may discuss separately. These types we may sum up as follows: (*A*) the initiation of the meaning factor stimulated primarily by the adjustment stimulus and secondarily by the auxiliary stimuli, and operating in direct conjunction with the definitive response or through the intermediation of auxiliary responses; (*B*) the functioning of the auxiliary reactions in connection with the preceding meaning reactions and the following consummatory response; and (*C*) the operation of the definitive final response.

(*A*) *The Meaning Factors.*—As soon as the stimulus appears the volitional reaction begins; but, as we have seen, these reactions operate under shifting and relatively indefinite conditions, so the definitive response must be preceded by other and aiding reactions. In everyday speech we should say that the person must discover and know what to do under the present circumstances. Our interest here is to point out that we have movements or other acts initiated at once, which acts belong to the volitional pattern of response but are not the definitive reaction system. In every case, however, they are not merely parts of the behavior pattern but condition the later parts. To illustrate, I perceive the tennis ball coming toward me and my definitive act must be the placing of it at some definite point on the opposite side of the court. Now before I can accomplish the necessary act I must

discover the best way to strike. This anticipatory knowing action consists of various movements of the person preceding the specific striking act.

Now such reactions as we have been indicating, which function to determine the future or further operation of other reactions, are meaning responses. And while they may not always be open to the observer's inspection as is true of all the subtle implicit meaning reactions, they are nevertheless always components of the volitional behavior segments. These meaning responses need not always be clearly prior in action to the other two phases, but may in some cases operate practically or quite simultaneously with the auxiliary reactions and possibly almost simultaneously with the definitive response also.

Precaution must be rigorously observed to the end that we may not confuse these meaning reactions with perceptual responses which always have a place in every complex behavior segment.[1] Perceptual reactions are indeed themselves meaning responses of a sort, but are quite distinct from the type under discussion. The meaning responses which we are now describing are determining or conditioning responses operating in addition and posterior to the perceptual responses. In general, we may distinguish between the perceptual and volitional meaning reactions by observing that the former are more closely connected with the adjustment stimulus while the latter are more definitely integrated with the definitive response.[2] The distinction between the perceptual and other latterly occurring meaning reactions may well be illustrated by indicating that whereas the perceptual reaction constitutes the person's awareness of the identity of an object, the other meaning reaction comprises his appreciation of what to do about it. Such an appreciation we ordinarily refer to as an understanding about the thing,

[1] Reflex responses, for example, comprising as they do a single reaction system only, involve no separate preceding perceptual reaction system. *Cf.* Kantor, 'The Psychology of Reflex Action,' *Amer. J. of Psychol.*, 1922, **33**, 19–42.

[2] The perceptual reaction system is of course very closely associated with a final reaction, but in the case of volitional behavior this final reaction is not the same as the definitive response. It would be more like the standing, looking, and head-straining acts which are inside the behavior segment and precede the definitive action.

especially when the appreciating person can state the fact in words, and in practically all cases it involves an immediate positive or inhibitional action (moving toward it or away from it, seizing it, or checking all such action) with respect to that object.[1] The simpler form of perceptual meaning reaction is called merely seeing or otherwise sensing, because the activity is much less complex and to all appearances always less discernible.

Furthermore, the meaning reaction may be and usually is stimulated by the combination of adjustment and auxiliary stimuli, whereas perceptual responses have only their specific adjustment stimulus objects or conditions and their settings. That the distinctly volitional meaning reactions can follow the perceptual response is manifest from the fact that it may just as likely follow another type of meaning reaction. Upon the clue that volitional meaning reactions may be overt or implicit we may proceed to expose two varieties of the meaning phases of volitional responses.

1. In the first of these varieties the adjustment stimulus calls out a compound series of acts all of which are closely interconnected with the final action. The segment of behavior works out as follows. The necessity to do something we may consider to be the adjustment stimulus. This stimulus is attended to and perceived auditorially perhaps as a bit of imparted information or visually by the condition of certain objects. Immediately a series of interconnected reactions follow. Similarly, in aiming a gun, when the mere aiming is the act in question, the presence of the stimulus conditions brings about the appropriate responses. The essential fact here is that some of these reactions serve as meaning responses; in other words, they determine the character of the later reactions and the definitive response. Eschewing completely the mentalistic implication, we have here typical cases of what James called 'resident and remote controls.' This means to say from our standpoint not that mental states control muscles but that preceding reaction

[1] Let us suggest the fact that it is because volitional responses are correlated with fairly indefinite and shifting stimuli that the two types of meaning reactions are necessary.

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systems condition succedent ones with a final determination of the consummatory response.

2. Turning to a somewhat more complicated situation, the person, besides attending to and perceiving the occasion for action, must also pay attention to the stimulus object we call the first auxiliary stimulus. Here we note the distinction between the adjustment stimulus which may be an object as well as a condition and the other stimuli in the behavior segment. Such a situation would be represented by language behavior or aiming a gun at a moving target. In other cases the occasion for action is not sufficient to initiate the overt meaning action which led to the definitive aiming response, or in other words the overt meaning acts are insufficient determiners of the aiming act. In addition to these overt precurrent acts this type of behavior segment requires a series of implicit meaning responses. These responses operate as images or ideas as to how to point the gun and refer to both position and rate of movement of the target or the appropriate use of words and mode of expression in a language situation. The person may have either a definite or a vague appreciation of what the needs of the situation are and how to meet them.

(*B*) *The Auxiliary Intervening Factors.*—The auxiliary responses are indirectly stimulated by the adjustment stimulus, but they are still essentially independent responses excited to action by their own stimuli. These intervening responses are well illustrated by the acts of getting the key, switching on the light, etc., which are performed as part of the action of getting a book which we know is in the library. Because of the influence of the adjustment stimulus upon these intervening responses they are of course directly connected with the definitive reaction and as a consequence of their independence they have a decided influence upon the final reaction. Plainer put, the dual connection of these interposed responses makes them not only into means for carrying out the final and definitive adjustment to the primary stimulus but also into actual and rigorous determiners of that adjustment.[1]

[1] These intervening reactions may be to a certain extent at least meaning reactions,

As in case (*A*) so here the intervening responses may all be either (1) overt or (2) implicit, and moreover there may be here also combinations of overt and implicit reactions, as well as (3) the semi-overt verbal reaction. In fact, verbal responses constitute a large portion of the intervening responses in volitional reactions.

1. The merely overt intervening conditioning responses are illustrated by the gross acts of walking, reaching, or stooping in order to carry out some definitive response to a stimulus. Some striking though not common actions which show this type of intervening function are the balancing movements made by the tight-rope walker and the bicycle rider in the acts of getting from one place to another. Again, in reading, numerous eye movements constitute the intervening responses.

2. Implicit intervening reactions may be considered as more definitely foresight responses than are the overt reactions, for we observe that while the former are stimulated in much the same manner as the latter, yet the very fact that the latter are implicit responses means that they are adaptations to absent objects. This means to say, then, that the adjustment stimulus object as well as some of the auxiliary objects have served in the capacity of substitute stimuli. Now because these implicit reactions are part of the total volitional behavior situation the absent objects or conditions reacted to are involved in the behavior segment in which they function and they operate effectively to condition the definitive responses. To illustrate, I am stimulated by a stack of letters to prepare replies, but an auxiliary stimulus indicates the lack of time to complete the task. It is necessary to foresee certain objects and to anticipate various conditions in order to arrange the work and select the part to do at once from the remainder which must be left for a later time.

3. Because of the commonness of verbal components of most of our complex behavior it is hardly necessary to

but in their independence of operation and remoter connection with the adjustment stimulus they are very different in function.

comment upon this form of intervening volitional behavior. We might indicate, however, that probably the verbal type of intervening behavior is best exemplified by the language manipulations in 'mental' or oral arithmetic.

In concluding this discussion of the intervening responses we are impelled to point out that not all the anterior determinations of definitive responses make for the smooth operation of them or for the advantage of the acting person. Quite frequently the interposed responses provide an untoward determination of the consummatory reactions. Often enough they serve most effectively to interfere and disturb the definitive response. This situation is well exemplified by the fumbling and generally disturbing responses which are introduced into a volitional behavior segment by the extraneous stimuli which 'rattle' the ball player as he is about to strike the ball. The universal knowledge of this principle lies at the basis of the hostile remarks of the supporters of the out-side team.

(*C*) *Definitive or Final Response.*—Whatever type of pattern is constituted by the precurrent phases of volitional behavior, the final response may consist of two general types of action. On the one hand, it may be a single reaction system or a group of closely integrated reaction systems; on the other hand, it may be a rather complex series of more or less discrete reaction systems. In the first type the final act would be illustrated by jumping off the tight rope when the walker gets to the end of it or it might consist of writing one's name on a paper after having reached for and secured it. The more complex situation would be illustrated by all the page turning and place determination involved in looking up a word in the dictionary or the activities included in the swinging of one's golf club after having performed the preliminary actions.

Wide bounds must be allowed in many cases for the operation of the final or definitive action, for the detailed responses may be many, although great precaution is necessary to prevent us from overstepping the limits of our given behavior segment. This means to say that frequently it

is extremely difficult to delimit the boundaries of volitional behavior segments or to determine exactly where a volitional reaction leaves off and some other reaction begins. Thus in our illustration of reaching for a book to look up a word it may be that the turning over of the first page is the end of our first volitional segment and that immediately after this a new segment is initiated. Theoretically, of course, we have a decisive criterion, namely, the operation of a new adjustment stimulus, but in practice we frequently find difficulty in determining what the new stimulus is or when it begins to operate.

The definitive action in volitional segments, whether complex or simple, may be overt, implicit, or verbal. The act may consist of a stroke of a bat or golf stick (overt), the thought of a person or object (implicit), or the pronunciation of a name or other word or phrase (verbal).

IV. *Classification of Volitional Action.*—When we attempt to introduce some sort of classificatory order into the thousands of volitional reactions that we are constantly performing we discover that the differences between such reactions comprise variations in complexity, diversity in the specific manner in which the definitive responses are conditioned, and dissimilarity in the number and types of stimuli operating in the various segments. Upon the basis of a joint consideration of these criteria it is possible to classify and arrange in some order the various types of volitional behavior. From the exceedingly numerous classes of such behavior we arbitrarily select and describe six illustrative classes.

1. In the first class, in ascending order of complexity, we have a series of behavior segments in which the adjustment and the auxiliary stimulus (there is only one of each of these) consist of the same object, for example, the brake which needs to be set (adjustment stimulus) and is stuck (auxiliary stimulus). The attention and perceptual reactions will be comparatively simple, since there is only the one object to attend to and perceive. Again, the conditioning reactions will be fairly simple, completely overt, and entirely integrated with the definitive or consummatory response.

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2. In the second class of volitional responses the adjustment and auxiliary stimuli are not the same object. We can react to the speeding tennis ball and to our opponent at the same time. Our attention in various degrees and alternations must be directed toward the two stimuli, as well as our perceptual acts. Now in this class of volitional reactions we assume that there are auxiliary reactions which are both integrated and unintegrated with the terminative response. All the auxiliary responses that are not in the direct line of the stroke (speech reactions for example) may not be integrated with the latter, but the responses that are directly connected with the definitive response may also be intimately integrated with it.

3. A still more complex class of acts would be those in which besides the adjustment and the auxiliary stimuli there may be one or many other stimulus objects or conditions calling out reactions which function to condition the definitive response. These auxiliary responses are overt reactions operating as more or less independent actions between the earliest attention, perception and meaning actions of the volitional segment, and the consummatory response. In these types of volitional actions we may well expect the attention and perceptual responses to be enormously complicated. Well exemplified is this class of volitions by the behavior segment in which one finally arrives at the proper point in the stream and casts the trout fly.

4. Very different from the foregoing forms of volitional reactions are the segments in which preceding responses serve as definitive stimuli for the following responses in the segments. This condition introduces a greater complexity in the total behavior segment and a greater preliminary indefiniteness in the final action. The latter is in consequence all the more conditioned by the preceding responses. Such segments operate, of course, in situations in which the definitive response is not entirely determined by the adjustment stimulus. For example, in case of fire one must remove certain valuables to a place of safety, but just where the disposition of the articles will take place will be determined more

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by what the person will be made to do in the course of working out the behavior segment, by various exigencies (auxiliary stimuli), than by the adjustment stimulus.

5. A more complicated and differently operating determining influence is found in the volitional reactions in which the definitive response is conditioned by implicit responses. Such segments involve the adaptation of the person to objects and conditions which are not present but which necessarily must be taken into account in order to carry on the response to the original adjustment stimulus. These implicit reactions may operate in two distinctly different ways. In the first place, such responses may merely facilitate the ongoing of the behavior segment which is occurring at the moment. That is to say, the implicit response may facilitate the progress of the person toward the completion of the definitive response. Or in the second place, the implicit response may operate to condition what the final reaction shall be or shall be like. This latter situation represents a more complicated type of volitional response and must be placed in another class.

As an example of a volitional reaction of class 5 we may take the case of the person escaping from a fire. The stimulus is fairly exacting and the course of the volitional segment may be determined by the implicit responses. The reader will observe that but for the kind of reaction involved, implicit rather than overt, the present class of acts are like those of class 4. In class 5 the determining response is a reaction to any immediately present object, but such present objects serve as substitute stimuli for absent objects, conditions, or actions. Our point here is that the definitive response in the segment is determined by the implicit action serving as stimulus for another action in the segment. Perhaps another illustration will clarify this point.

I am stimulated to make some extemporaneous remarks at a dinner gathering. Immediately it is necessary to seize upon a topic and most likely the occasion which brought the members of the party together will serve as the source of that speech. As I gather momentum for my speech I observe

several of my neighbors and under the proper circumstances thereto I begin to reflect upon what 'X' is thinking about my handling of the subject. This implicit response to his thought may stimulate me in such a way that my further remarks assume such a shape as to make my speech an entirely different sort of thing than it might otherwise have been.

More complications may be introduced into the total volitional behavior segment if we further consider the person making the speech and his reactions to himself as constituting the source of the responses which condition the later behavior and in turn the terminative response of the particular behavior segment.

6. By far the most complex type of volitional reaction is the one in which the definitive response is almost completely determined by the precurrent responses in the behavior segment, rather than by the adjustment stimulus. The latter in this case merely determines that the act should occur and conditions some of the precurrent acts. This type of determination of the final response by precurrent responses we might look upon as a definite form of anticipation. The person is stimulated to bring about some sort of condition, say the construction of a house or the setting up of a piece of apparatus. But just how the apparatus or the house should be designed or built must be determined by the nature of the results to be obtained, and yet no very precise specifications are available. The individual must then respond implicitly to much of his past actions in previous similar situations and to the objects there met with, in order to design and construct some sort of similar apparatus which correlates with or is in some sense common to similar conditions in the individual's past experience. This class of volitional reactions in their typical form may be thought of as at least approaching the inventive. Let us note once more that the stimulus conditions the individual to perform a type of reaction which has no definite model but which has to be organized and determined by the general conditions of the stimulus.

V. *What are the Stimuli and Stimulus Settings in Volitional Behavior?*—The problems involved in the study of the stimulus factors in volitional behavior segments are manifestly more crucial than they are in other cases of psychological behavior. For in addition to the functional indefiniteness of the adjustment stimulus the other stimuli are very complex, many of them operating and all of them functioning in peculiar combinations. We may consequently divide up our analysis of the stimulus conditions into four general divisions, to wit, (*A*) classes of stimuli according to their nature (kind of thing), (*B*) classes of stimuli according to their function, and (*C*) classes of stimuli according to their complexity and temporal position in the behavior segment. To this triple division of stimuli must be added (*D*) some observations concerning the settings or background of the stimuli.

(*A*) *Classes of Stimuli according to their Nature.*—From the nature of the volitional behavior segment it follows that the stimuli for such activities will be exceedingly contingent and peculiar to some very specific situation. Even when the stimuli are concrete objects, therefore, they will have to fit into an immediate momentary situation. For example, if we are responding to an opponent in a game we always find him to be a shifting and unstable object. Otherwise, of course, we would not be observing volitional behavior but rather habit responses or other forms of behavior. Needs, events, actions, and conditions therefore will constitute a large portion of volitional stimuli.

In general, we might suggest that the most typical feature of volitional stimuli is the characteristic of indefinite definiteness which they carry. This characteristic is excellently illustrated by the stimuli which we name specifications. That something must be done we are thereby informed; also it is made known to us what sort of result is expected but just how the activities will be executed remains to be determined by the particular exigencies of the behavior situation. Not to confuse this reaction with voluntary behavior we must add that we are not concerned here with anything

but the carrying out of a plan of action, not at all with choosing the plan.

Conventions of various sorts and social contingencies are stimuli for complex volitional responses. Precedents and other social institutions set our paces for all sorts of social conduct for the precise carrying out of which various other auxiliary stimuli provide the immediate conditions. Such conventions also function as fertile sources for auxiliary stimuli of all sorts which operate to determine definitive responses stimulated by other objects and conditions.

(*B*) *Classification of Volitional Stimuli according to their Function.*—Here we need only set down the fact that besides the adjustment and auxiliary stimuli, the nature of which we have already had occasion to point out, we find other stimuli in volitional behavior segments all of which, however, may be called auxiliary. These latter are divisible into various orders according to their places in the behavior segment. To illustrate, the need for some particular kind of paper upon which to make a note may be considered the adjustment stimulus; the absence of this special type of paper may be considered an auxiliary stimulus of the first order. Now the next stages of the volitional behavior pattern will involve movements stimulated by the chairs, doors, cabinets, etc., met with in searching for the paper; these objects we may refer to as auxiliary stimuli of the second order. Again, when a volitional behavior segment involves much preliminary trial and error action these acts themselves constitute stimuli which influence the definitive response, and we may name these, auxiliary stimuli of the third order. Prominent among such determining actions are the language responses of various sorts.

It may well be that a still more intensive analysis of volitional behavior than we have already made might yield even more determiners in the form of stimuli which we might consider to be auxiliary stimuli of higher orders than those we have mentioned.

(*C*) *Classification of Stimuli according to their Complexity and Temporal Position.*—As we might expect, the volitional

responses having so many stimuli may operate in different manners and combinations. To express it differently, they may function singly or in groups and constellations; in the latter case a number would be functioning simultaneously, whereas in other cases they operate in chronological order. Stimulus conditions vary greatly of course with the complexity of the behavior situation and it is possible that we may have a single adjustment stimulus and a constellation of some one or all of the different types of auxiliaries, either operating in chronological order or simultaneously. We cannot at this point resist the temptation to indicate again that the auxiliary stimuli operate directly or indirectly to determine or condition a final response which is not completely and exclusively determined by the adjustment stimulus.

(*D*) *Volitional Stimulus Settings.*—Possibly much more than in other types of behavior do we find in volitional action a great prominence of the various stimulus settings. What ordinarily amounts to no more than a background for a stimulus-object, bringing about a refinement in the response or a sharper differentiation of stimuli by specialization of action, becomes in volitional behavior segments definite stimulus factors. These setting objects or conditions become in many cases full-fledged auxiliary stimuli. Reflect upon the prominence of the settings to the stimuli in a chess game or in some similar behavior situation. What is at one moment, when a given move is made, the background of one's stimuli, becomes later, when the opponent is moving, a very decided stimulus itself for one's own next action. How important the settings appear in such a situation is also manifest from a common but erroneous belief that all the chessmen are at once the stimulus to every move reaction.

The extreme importance of the stimulus settings in volitional behavior is a consequence of the contingent character of the total situation. Very striking is the contrast in this respect between the volitional action and a reflex response. In the latter case the adjustment stimulus is not only the only one operating, but the setting or background of the stimulus ordinarily plays no part whatsoever in the behavior

segment. When in comparatively infrequent situations the settings do figure in the behavior circumstances they serve merely to increase or decrease the vigor with which the response is performed, but they cannot alter the morphological character of the response. Quite different is the situation in volitional behavior segments; in every case the total general surroundings have both indirect and direct influences upon the intimate characteristics of the behavior pattern.

Correlated with the increased function of the setting which makes it into an auxiliary stimulus, is the shifting of the adjustment stimulus to be the background of the now prominent setting. In most instances probably the setting objects could not become actual stimuli without this functional modification of the adjustment object or condition in the behavior segment. These functional displacements are all of course typical consequences of the fortuitous character of volitional behavior.

VI. *Volitional Actions as Performative and Informational.*—Contrary to the usual notion we believe volitional actions comprise informational responses as well as performative reactions. That is to say, volitional acts may consist of responses in which the individual performs some sort of knowledge or informational adjustment to some object as well as overt manipulations of all sorts.[1] In support of this thesis several propositions may be adduced.

In the first place, no principle of volitional behavior is opposed to this thesis; rather the description of volitional reactions is entirely consonant with our view. For if volitional behavior consists essentially of a mode of adaptation in which there is a definite and auxiliary response and moreover an adaptation in which the definitive response is determined by auxiliary stimuli in addition to the adjustment stimulus, then it is entirely possible that the adaptation may be informational as well as performative.

In the second place, when we ask what determines whether a reaction is informative or performative do we not get the

[1] Whenever we 'place' a vaguely familiar individual somewhere in our past experience we are performing an informational volitional reaction.

answer that this is entirely a functional affair? That is to say, if the behavior segment adjusts the individual by way of some cognitive orientation we call it a knowing or informational reaction, whereas if the reaction results in some change in spatial relation between the person and the object we call the reaction performative. Now it is certainly clear that volitional responses may be of both sorts, and our criterion as to which sort lies in the nature of the definitive response and the adjustment stimulus. Do not many if not all of the trial and error manipulations in reasoning activities answer to our description of volitional reactions? And when such reasoning reactions are theoretical in character and not practical problem-solving activities then the volitional responses are informational. The same designation may be correctly applied to numerous of our volitional responses when they are autonomous and independent of other reactions.

That volitional responses may be informational as well as performative appears likewise from the fact that in the actual determinations of the consummatory reaction many informational stimuli may operate to excite determining knowledge reactions. This is true of course of any sort of volitional reaction and especially so when the definitive response is itself informational in character. To a certain extent, then, all complex volitional reactions, at least, involve informational behavior of various sorts in the carrying out of the total segment. Is it not very likely then that the whole segment should be informational in character?

VII. *The Range of Volitional Behavior.*—Here we might raise the general question as to what sorts of situations involve the operation of volitional behavior segments. The answer to this question is in our opinion simple and unequivocal. Probably every one of our complex human situations provides us with a series of occasions to perform such behavior. Whenever we adapt ourselves to different or somewhat unfamiliar surroundings, when we are obliged to handle tools or manipulate complex objects such as machines, while playing games of various sorts or engaged

in constructive activites, we perform a great many volitional responses.

If we consider the situations just mentioned as the stimulus conditions for individual responses we may then refer to another series of situations as social. All of our social situations are replete with conditions in which our definitive responses must be carefully and directly determined by a variety of auxiliary stimuli, in many cases very prolific in number. These social situations all supply us with fairly indefinite situations for the adjustment to which are required the distinctly volitional forms of behavior.

Possibly the whole problem of the range of volitional behavior can no better be comprehended than by pointing out that for the most part our language responses conform to the volitional type of behavior. The carrying on of a conversation or the delivering of an oration constitute a most intricate complexity of volitional behavior adjustments.

VIII. *The Development of Volitional Responses.*—Volitional reactions have histories. No matter how complex or how indeterminate in character they are, they must date back to previous coördinations of responses and stimuli. Indeed this principle marks an essential condition for the operation of any volitional reaction at all. This does not mean merely that certain phases of the volitional response such as the auxiliary reaction systems constitute part of the behavior equipment of the person. It means more than this; it means that no complex volitional action can be an actual adaptive action unless there exist genuine associations between the various stimuli and the various responses in the behavior situation for the particular person who is involved in it.

Furthermore, there is no doubt that all connections between responses and stimuli in a volitional-behavior situation represent coördinations which go back to some historically anterior trial and error contact of the person with the general stimulating conditions in which the reaction is performed. Were it not for this fact it is doubtful whether determining responses could condition consummatory re-

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actions. Moreover, it is certainly true that a person will be most efficient in performing indeterminate actions who has had most experience in that particular field. The machinist who starts out to execute a specified activity finds many suggestive stimuli to condition the prompt and effective carrying out of that project, whereas the uninitiated individual finds either undetermining stimuli in the various machinists' objects (tools) or else all the stimuli happen to be thwarting. It must be very carefully observed, however, that the possibility and effectiveness of the operation of volitional behavior segments depend entirely upon the fact that numerous reactions may be made to influence each other rather than upon any very definite organization of responses with each other. Prominent remains the fact that volitional behavior consists of adaptations to unstable and unstandardized conditions which require a not too close connection between responses if we are to meet the given situation, although without some connection the whole adaptation would remain unachievable.

That in general the components of volitional reactions must have some organizational history appears also from the fact that were this not so and the adaptation were made, it would have to be a totally new adjustment as far as that is possible in human behavior. But this is never the case in volitional action. The stimulus circumstances do not demand it nor do the reactional situations justify such an interpretation. Now this, as we have seen, happens to be precisely the practical distinction between volitional reactions and voluntary actions. In the latter case we may assume that the actions involve the development of a practically new mode of response. In the case of volitional reactions, on the other hand, we really have no more than a new combination of previously acquired stimulus and response coördinations.

IX. *The Conditions of Volitional Behavior.*—Already we have seen in the preceding section that when a person has had considerable experience in forming particular sorts of stimulus and response coördinations this experience consti-

tutes a favorable condition for that person's participation in volitional reactions related to that type of stimulus and response coördination. To this condition we must add others, among them being the availability of objects and persons which can constitute stimuli to determine the operation of the volitional reaction and its progression toward its definitive conclusion. The more possible stimuli (objects, persons, etc.,) we have around us the more chance there is for the volitional action to occur and the greater our ability to adapt ourselves to a shifting and indefinite situation. Absolutely indispensable, of course, is the presence of some of those possible stimulus objects for the ongoing of the volitional act at all. The number of possible stimuli is then a functional factor in the facilitation of the working of volitional behavior.

X. *Volitional Reactions and Habits.*—No one, it is safe to say, will confuse volitional reactions and their operation with habit acts and their particular mode of functioning, especially when the more complex forms of volitional reactions are concerned. It may be true, however, that the simpler sort of volitional reactions may appear to the observer to be very like the habit response. We propose, therefore, to suggest a fundamental criterion which will distinguish these two types of behavior. Let us note that volitional behavior, no matter how simple, involves a reaction within a reaction; that is to say, it consists essentially of the operation of a definitive response to an adjustment stimulus, a definitive reaction which is not only conditioned by that adjustment stimulus but is also very closely and definitely determined by auxiliary responses and their stimuli. In the case of habit responses, on the contrary, we have a single form of activity, integrated from simpler activities in some cases, to be sure, but still a single mode of adaptation which is very closely integrated with a single adjustment stimulus.[1] Again, volitional reactions contrast very markedly with habit activity in that the former is not determined until the definitive response is about to operate, whereas the latter was entirely

[1] For a detailed description of habit reactions, *cf.* Kantor, 'The Integrative Character of Habits,' *J. of Comp. Psychol.*, 1922, **2**, 195–226.

determined at some past period when it was originally acquired as a reaction. As a consequence of the differences between volitional reactions and habits the latter appear as entirely automatic, while the former have the appearance of being completely casual and occasional.

XI. *Do Animals Perform Volitional Reactions?*—Complex as volitional reactions are there seems no good reason to assume that the higher animals do not perform such behavior. This statement does not hold, however, for the very complex types. It is no doubt the case that probably no animal, even of the highest order, performs the type of volitional reaction in which the organism definitely anticipates some specific mode of response. This conclusion we may reach from an observation of the complexity of the action itself as well as from the consideration that such complex activity involves much implicit behavior of an intricate sort. The evidence from animal studies leads us to doubt much whether any animal is capable of performing such intricate implicit responses.

Probably the best evidence we have that animals can perform even complex volitional responses is found in the experiments upon animals in puzzle boxes. There can be no question but that the act of a cat in working its way out of a cage involves a great deal of volitional behavior, but those same experiments indicate that the type of volitional behavior in which complicated implicit reactions are necessary fall outside the range of the animal's capacity to perform.

XII. *Volitional Reactions and Knowledge.*—In the traditional psychological treatises volitional reaction is always considered to be closely connected with knowledge, for in the first place, volitional reaction is not distinguished from voluntary behavior, and in the second place, the organism performing volitional reaction is presumed to possess some definite foreknowledge of what he is about to do. We believe that while it is entirely proper to say that volitional reactions involve knowledge, this knowledge is not as we have indicated a very deliberate form of anticipation of the definitive response excepting in the most complex voluntary reaction. To be very plain, we reject completely the con-

ception that knowledge represents some sort of mental state entity different from the motor action which follows it. We cannot conceive of psychological phenomena except as members in a homogenous series of activities of the person which differ only in functional and morphological details.

For our own part, we believe that knowledge in volitional reactions is constituted mainly of the operation of medial stimuli, namely determining responses and their stimuli in addition to the adjustment stimulus. Knowledge in volitional reactions, we conclude then, is distributed throughout the whole behavior segment. This whole matter may be best worked out by a brief consideration of what knowledge is from a psychological standpoint.

As a psychological term, knowledge, if distinguished from cognition, is merely a more complex form of behavior than the latter. Now cognition in general means merely the operation of a differential response which has previously been coördinated with its particular stimulus. Of these reactions we may say that while performing them the person appreciates the presence and nature of the stimulating object. Such cognitive activity we find of course in abundance in volitional reactions, for observe that we have a large number of stimuli in such reactions.

Briefly, then, we might indicate that much of the knowledge in all volitional reactions consists of the perceptual responses to the adjustment and auxiliary stimuli. Also, in all volitional reactions the overt and implicit meaning responses represent knowledge reactions of varying complexity. Likewise, the elaborate implicit anticipatory responses which look toward the consummatory reaction rather than to the present stimuli, constitute very definite forms of knowledge reactions. It is these forms of volitional action components, we believe, that are usually thought of as the foresight responses. Now we suggest that because such responses are found only in the most complex volitional behavior patterns, we must either enlarge our conception of volitional reactions to admit other forms than those which contain such elaborate anticipatory reactions, or else we must admit as knowledge all the other perceptual and meaning

reactions that are distributed throughout the total behavior pattern. Further, it may be suggested that whenever we have a complex anticipatory response in a behavior segment we always find there in addition a large number of the distributed knowledge factors; in fact, a larger number than when the complex anticipatory reaction is absent, for in the former case the total behavior situation will be more complex.

XIII. *Summary.*—First we suggest a distinction between volitional and voluntary action and then proceed to an analysis of the former, which we characterize as consisting of actions within actions. The volitional behavior segment is described as a series of stimuli and responses. The adjustment stimulus initiates the behavior pattern, but does not completely determine what the final reaction will be. Exactly what sort of definitive response shall occur in these fortuitous behavior situations depends upon a series of additional or auxiliary stimuli and their responses.

In the actual operation of volitional reactions we analyze, besides the attention and perception reactions, some additional precurrent responses which we differentiate into two classes, namely, meaning and auxiliary reactions. The former are more directly connected with the final or definitive response which terminates the behavior pattern, while the latter are less directly so connected, although both find a place in all complex contingent volitional actions.

In the classification of volitional reactions we use as criteria (1) the number and complexity of stimuli, (2) the way these stimuli condition the definitive response, and (3) the general organization of the behavior pattern. Six types are thus distinguished.

After an analysis of the stimulus factors in volitional behavior the question is raised whether volitional reactions are all performative or whether some of them are not informational in character. The latter alternative is indicated as the answer. Finally, by way of further elucidating the character of volitional reactions, we discuss among other problems the development, range, and conditions of such behavior.

DISCUSSION

SUGGESTION FOR A THEORY OF LEARNING

In a recent paper, it was said that one of the most important problems before the science of psychology was expressed in the question, "How are errors eliminated in learning so that the fittest acts, of all those brought out by the situations, survive in the form of definitely integrated responses known as habits?"[1]

The following is offered as a suggestion for a theory of learning which will answer that question and a number of others raised by the learning process. But it should be noted that the adjective 'fittest' applies only to certain cases of experimental learning and not to all cases of learning.

Briefly and directly, the suggestion is that, since learning is a process of habit formation, learning may be studied and accounted for in the same terms that apply to all habit formation, namely, in terms of the conditioned reflex process.

It is sufficiently obvious from the classical experiments of Pavlow that the concurrent presentation of a biologically adequate stimulus (the piece of meat) and an indifferent stimulus (the bell) operates, after a number of repetitions, to establish a positive conditioned reflex, or habit, of salivary response to the bell alone. And Triplett's experiment on the perch has shown that the blocking or prevention of a response to a biologically adequate stimulus (the minnows) by a physical deterrent (the glass partition in the aquarium) will, after a period, establish a negatively conditioned reflex, or habit, of no response to the formerly biologically adequate stimulus of minnows.

The general significance of the above may be expressed in some such manner as follows: the concurrent presentation of two stimuli, one a biologically adequate stimulus[2] and the other an indifferent or deterrent stimulus, will, after a number of repetitions, establish a positive or negative conditioned reflex or habit. A habit, therefore, is a response, acquired by experience, to a stimulus or situation,

[1] Joseph Peterson, 'A Note on Theories of Learning,' *Psychological Bulletin*, 1922, 19, p. 443.

[2] *I.e.*, a stimulus which evokes a response without prior conditioning by experience.

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which response before that experience was not evoked by that stimulus or situation. The experience by which the habit is acquired is the concurrent presentation of two stimuli in the manner previously described.

Habits are therefore of two kinds: those known as positive conditioned reflexes, that is, responses to a formerly indifferent stimulus; and those known as negative conditioned reflexes, that is, failure to respond to a biologically adequate stimulus. Of course, as Pavlow's work on reconditioning and inhibition has shown, there may be many combinations and permutations of conditioned reflexes or habits.

Now, to turn to cases of experimental learning with cages having a latch opening or with mazes of multiple 'choice,' we have two factors to be accounted for: one, the learning of the 'fittest' or effective behavior, as indicated by the learning to open the latch or to pursue the path which leads to food or to freedom; two, the elimination of errors or learning to avoid the behavior which does not open the cage door or lead to food or freedom. Both of these behavior responses are of the nature of habits, *i.e.*, they originate from conditioning of reflexes.

When the subject is placed in the cage or beginning of the maze, it is subject to two stimuli: first is the stimulus of the food outside of the cage or maze (the threshold to which has been lowered by starvation) or, to follow another line of analysis, the stimulus of the tensions in the autonomic system (hunger) which are acting upon the central nervous system and striped muscles; the second is the stimulus of the immediate cage or maze situation, a stimulus which is, in fact, a number of stimuli, such as openings between the bars, the bars of the cage, the latch on the door, etc., or the several paths of the maze opening before the subject.

The subject is therefore under stimulation of two kinds or from two sources: the stimuli of the immediate situation of the cage or maze and the stimulus of the remote food (or of the hunger tensions). Now, so long as the subject is responding to the remote food (or hunger tensions) and to the stimuli of those portions of the cage or of the maze which do not lead to the food, we have a case of a response to a biologically adequate stimulus (the food or hunger tensions) and to a physical deterrent to the approach to the food. When the subject is responding to the remote food (or hunger tensions) and to the stimulus of the movable latch or correct path of the maze, we have a case of a response to a biologically adequate

stimulus and to an accessory stimulus (such as the bell in Pavlow's experiment).

In other words, the immediate response to the non-effective portions of the cage or maze which act as deterrents or obstacles to the remote food stimulus operates to establish a negatively conditioned reflex, while the immediate response to the latch or correct path of the maze which leads to the response to the food operates to establish a positive conditioned reflex, so that after a number of trials the subject ceases to respond to the non-effective stimuli and learns to respond to the stimuli of the latch or correct path. Thereafter the subject when placed in the cage or maze responds positively to the stimuli which lead to the food and negatively to those which do not.

We may say therefore that the concurrent presentation of the stimuli of the latch or correct path and of the remote food stimulus establishes a habit or positive conditioned reflex, while the concurrent presentation of the stimuli of the deterrent portions of the cage or maze and of the remote food stimulus establishes a negatively conditioned reflex.

It is further suggested that the various theories of learning now current relate to elements or factors in the process of conditioning reflexes and therefore do not contradict or oppose the foregoing. Attention should be drawn to the fact that when punishment is added to the incorrect paths of the maze, it operates to expedite the negative conditioning to those paths.

The foregoing analysis applies to all cases of learning whether the habit acquired is the 'fittest' or the most effective or not. An infant learning to cry for attention or food by having the parents give attention or food whenever it cries, acquires a habit of crying by a process of positive conditioning, from concurrent presentation of two stimuli. A child learns to put on his bib or bring his mug to get food by a similar process, since the putting on of the bib and the getting of food have been concurrently experienced.

Superstitious customs and fetishes are acquired in the same manner, for the human subject is so easily conditioned that any accidental concurrence of two stimuli, for a number of times, or only once if sufficiently intense, will establish the habit of performing the action which chance has associated with the approach to a remote stimulus or the release of autonomic tensions.

It should be added, by way of further explanation, that the assimilation of the learning process to the conditioned reflex does

not, of course, tell how learning occurs, from the point of view of modification of the nervous process. Conditioned reflexes may be said to be the behavior aspect of hysteresis or associative hysteresis, which is a problem in colloidal chemistry. As in all scientific work, the solution of one problem merely pushes the inquiry further along and raises additional problems for another branch of scientific work. Apropos of the question of learning, it would be well to recall Jacques Loeb's 'Comparative Physiology of the Brain,' published some twenty odd years ago. It contains much food for reflection by psychologists of to-day.

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THE DIVERGENT RESULTS OF ANALYSIS

In a very recent paper[1] Professor Wheeler takes issue with my criticism of the outcome of his earlier monograph, 'An Experimental Investigation of the Process of Choosing'[2] and reiterates his 'former assertion that in the volitional consciousness there are to be found no feelings of mental activity and no consciousness of the self which are not exclusively constituted of sensation and image.'[3] He bases this reaffirmation of the exclusively sensational and imaginal nature of volition (and indeed of all experience) on the unimpeachable observation that introspectors are prone to mistake unanalyzed for analyzed experience and on the specific assertion that the psychologists with whom he differs have incompletely analyzed their volitional experience. On this position I desire to comment briefly.

1. Professor Wheeler is unquestionably justified in his criticism of Ach for being 'content to summarize his introspective data'[4] and in his objection to the procedure of Michotte who 'published excerpts only' of his observers' introspections and incompletely analyzed such experiences as doubts, recognitions, hesitations, and the like.[5] But in my opinion, Wheeler does not by these criticisms succeed in undermining Ach's and Michotte's introspective testimony to their more-than-sensational awareness of self and 'feeling of activity.' For the introspective records of both writers contain frequent references to sensations; and consequently their reports of activity-feelings are not to be attributed to either ina-

[1] 'Analyzed versus Unanalyzed Experience,' PSYCHOL. REV., 1922, **29**, 425–446. Unless otherwise indicated, all references are to this paper.

[2] University of Oregon Publications, 1920, 1, No. 2.

[3] *Op. cit.*, p. 446[2].

[4] *Op. cit.*, pp. 426[3] ff.

[5] *Op. cit.*, pp. 426[3], 432[1].

bility or unwillingness to record the occurrence of sensational elements. Furthermore, Wheeler's charge that non-sensationalists do not adequately analyze experiences falls far short of a demonstration that all experience, when completely analyzed, reduces to sensation and image. For this conclusion assumes the very point at issue, namely that the results of complete analysis must inevitably be sensational and imaginal. In a word, Wheeler may well be justified in his conviction that Michotte and Ach and Meumann and others have inadequately analyzed certain experiences; but when he adds that an adequate analysis would reduce such experiences, to exclusively sensational elements he ignores the possibility that further analysis would disclose non-sensational as well as sensational constituents.

2. Against this conclusion Wheeler would of course urge once more the inability of his introspectors to find any 'elemental' consciousness of self and any more-than-sensational feeling of activity. The chief implication of his recent paper is that this outcome of introspections so adequate as those which he reports ought, without further discussion, to be accepted as decisive.[1] But the critics of Wheeler, gratefully accepting all the positive content of his introspections, balk at the order to deny all that Wheeler's introspectors deny. These critics reiterate, first, that the occurrence in volition of a wealth of sensations is not incompatible with the simultaneous occurrence of non-sensational experiences. They urge, in the second place, that the failure of Wheeler's subjects to discover a self and a feeling of activity is easily explicable from mistaken preconceptions of the self and of introspection.[2] And they insist finally, that Wheeler is not even secure in his basal position—'my observers and I fail to find by introspection any consciousness of self or feeling of activity which is not exclusively sensational or imaginal, and therefore, there is no such consciousness'[3]—until he has successfully explained the frequent occurrence in the introspections of his observers, of assertions and implications of self-awareness.[4]

Wheeler dismisses this criticism very lightly. He admits, of course, the repeated references to self in the observations of his

[1] *Op. cit.*, pp. 425[2], 426[2], 435[4]f., 439, 445[2].

[2] *Cf.* 'Fact and Inference in Wheeler's Doctrine of the Will, and Self-Activity,' PSYCHOL. REV. 1921, **28**, p. 370 with footnotes; and 'The Self in Scientific Psychology,' *American Journal of Psychology*, 1915, **26**, 522–524.

[3] This is my paraphrase, not a quotation from Dr. Wheeler.

[4] *Cf.* 'Fact and Inference in Raymond Wheeler's Doctrine of Will, and Self-Activity,' *op. cit.*, p. 365[3] ff.

introspectors, but explains that these are either the statements of mere unanalyzed meaning, which are apt to precede introspection proper,[1] or else that they are 'interpretations,' following introspection, in which we tell 'the experimenter something more than we experienced originally.'[2] Both meaning and interpretation are, he holds, unanalyzed experiences reducible to sensory and imaginal contents. But Wheeler can hardly evade his critics so easily. They will point out that the 'self-questioning,' the 'self-imposition' and similar experiences, reported by his reagents, are scattered through their introspection, for all the world like plums in a well-stirred pudding,[3] and cannot therefore be relegated, after Wheeler's fashion, to periods preceding and following genuine introspection. The critics of Wheeler will furthermore protest that his tendency, fashionable as it is in contemporary psychology, to describe all non-sensational consciousness as 'meaning' and then to damn all 'meaning' as inevitably unscientific, is simply another way of begging the question at issue, an *a priori* decision against the case for the occurrence of a more-than-sensational experience.

3. It should be noticed, in conclusion, that Dr. Wheeler has simply ignored the most specific of the difficulties inherent in his account of volition. It consists in the incompatibility of the fact that people so obviously agree with regard to the meaning of volition with the fact that they so palpably differ in the sensational and imaginal experiences to which, in Wheeler's view, choice and volition reduce. Both facts are admitted by Wheeler. "The fact that we all know when we . . . are experiencing a volitional consciousness is sufficient evidence," he says explicitly, "that we are experiencing the same processes in the main."[4] And his introspective records are evidence of the individually varied sense contents of these volitional experiences. Until he supplements his enumerations of the very diverse sensations in different cases of volition by a statement of the precise sensation-complexes which distinguish one type of volition from another, and volition from other forms of awareness, Wheeler certainly has not said the last word on the nature of choice and volition.

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[1] *Op. cit.*, p. 436[1] *et al.*

[2] *Op. cit.*, p. 427[4]. The terms meaning and interpretation seem sometimes not to be distinguished by Wheeler.

[3] *Cf.* 'An Experimental Investigation of the Process of Choosing,' *passim*, and 'Fact and Inference in Raymond Wheeler's Doctrine of the Will and Self Activity,' *op. cit.*, pp. 359 ff.

[4] *Op. cit.*, p. 436[1].